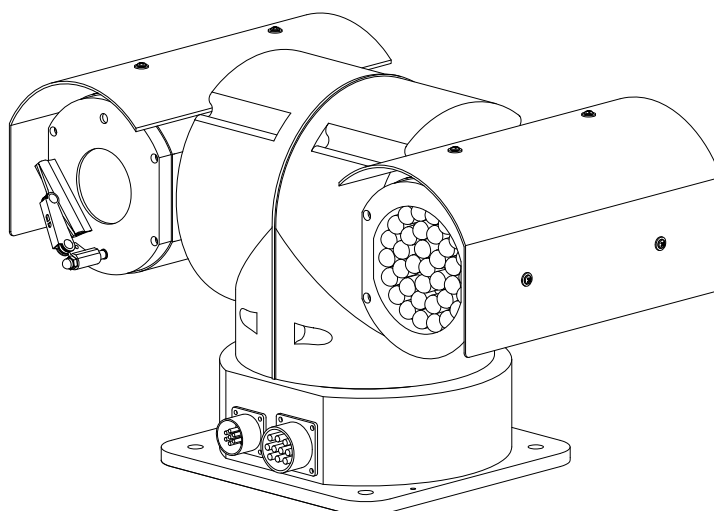


Operation Manual of Outdoor High-Speed Pan/Tilt with Infrared Lighting

VER: 2.0



Please read the manual carefully before using the product.

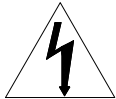
Safe Note :

Note:

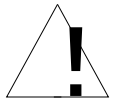
To avoid electric shock danger, please don't open.

Note:

To avoid electric shock, please don't dismantle by yourself. There is not parts can be dismantled by user himself, should be maintained by qualified.



The arrowhead sign shined in triangle to remind user the non-insulated dangerous voltage appearing near the product is dangerous to human beings.



The note sign in triangle is to remind user refer to the spec on important operation and maintenance.

The serial NO. is signed at the bottom or side. Please fill the serial NO. in the blank below, and keep the spec well to check when needed.

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Notes for Attention :

1. Read the manual carefully before installing the product.

➤ Electric safe

Observe all national and area electric safety standards in application. Adopt special power supply attached the product. There are two input ways of power supply: DC12V (vehicle) and AC24V (normal pan/tilt). Observe all electric safety standards in application and adopt special power supply attached the product. RS-485 control signal and video signal should be kept enough distance with the high voltage devices and cables during the course of transmission, and take protection measures such as anti-lightning and surging etc. if necessary.

➤ Transport carefully

Avoid incorrect operation methods such as heavy pressing, strong vibration, dip in, etc. during the course of transportation, store and installation otherwise the product could be damaged. There are sophisticated optical and electronic components inside the product. Please do not dismount components inside the product to avoid occurrence of trouble. Whether delivery or return for repair, if there is no part inside the product, then needs repair by customer himself.

➤ Install carefully

Read the manual carefully before installing the product. Take the module gently, do not press structure parts, otherwise the machinery trouble will be caused; Transparent cover is advanced optic products, avoid directly touch result in scratches on the cover, effect image quality.

➤ The competency requirement on maintenance person

The installation, maintenance about the device should be installed by the qualified maintenance technologic person. When the device has problem, find the problem according to spec first instead of maintaining it in a hurry, find the professional maintenance person if can't find the reason. About the maintenance, should be carry out by the authorized maintenance person.

➤ Don't dismantle camera arbitrarily

Don't dismantle the screws or protective cover, there is no parts can be dismantled by user himself, should be maintained by the qualified.

➤ Environment request

Temperature : -35° ~+55° Humidity : 90% Air pressure : 86-106kpa

Power supply : DC12V (Vehicle) /AC24V (normal pan/tilt)

➤ Installation request

● When installing, please install in the place which have enough bearing capacity.

- Don't storage, install and use the product in inflammable, explosive dangerous eare.
- Do not apply the product under the state exceeding limited temperature, humidity or specifications of power supply.
- Please don't dismantle parts inside device to effect using, there is no parts inside can be maintained by user himself.
- Do not aim the camera at the sun or very bright object, aim or monitor bright and still object for a long time whether the power supply of the camera is switched on or off.

**The whole machine can be kept repair for 3 years
(Remark: the camera is kept repair for 1 year).**

The first chapter **Description of Functions**

This product is a high-tech monitor and controller which incorporates high definition color camera, universal variable pan/tilt, infrared lighting, multi-functional decoder, character superimposing, alarm input/output into a whole, reduces interconnections to a great extent among parts in the system and rises up the reliability of the system. In addition it has advantages of easy installation and maintenance, beautiful appearance, lightweight and flexible, simple operation etc.

1.1 Pan/Tilt Specification

Power Supply	AC24V±10% 2.5A
Power Consumption	50VA
Weight	7.5Kg
Installation Style	Plain Base Installation
Relative Humidity	10 ~ 90%
Operation Temperature	-35° ~ 55°C
Waterproof Class	IP66

1.2 Basic Functions of Pam/Tilt

Pan preset speed	80°/s
Tilt preset speed	60°/s
Pan speed	0° ~ 60°/s
Tilt speed	0° ~ 40°/s
Preset Position	128 positions in maximum
Patrol Function	6 patrol patterns are stored in maximum
Scanning Speed	0.5 ~ 30°/s
Self-Study Pattern	40sec

1.3 Infrared Lamp

Infrared Illuminator	High Brightness LED×36pcs
Wavelength	850nm
Project Distance	120m
Power Consumption	4W
Control of Infrared Lamp	Auto/Manual control on menu
Service Life of Infrared Lamp	Over 20000 hours

1.4 Alarm

Four Channel Inputs	Normal Open, closing for alarm
One Channel Output	Normal Open, Normal Close Output

1.5 Camera Functions

Model		18×	22×	23×	27×
		D/N	Color	D/N	D/N
Synchronization System		Inside/Outside			
Image Sensor		1/4"Exview HAD CCD			
Scan System		2:1 scan separate line			
Horizontal Resolution		≥480TVL			
Effective Pixels	PAL	752×582(440K)		758×592(450K)	795×596(470K)
	NTSC	768×494(380K)		758×504(380K)	811×508(410K)
Lowest LUX		1Lux /0.01Lux	0.2Lux F1.6	1Lux /0.01Lux	1Lux /0.01Lux
Iris		Automatic/Manual			
Focus		Automatic/Manual			
Zoom		Optic 18×	Optic 22×	Optic 23×	Optic 27×
		f=4.1 to 73.8 mm	f=4 to 88 mm	f=3.6 to 82.8 mm	f=3.6 to 98 mm
Angle of view		Wide:48°	Wide:47°	Wide:54°	
		TELE:2.7°	TELE:2.2°	TELE:2.5°	
Backlight Compensation		Automatic/Manual			
White balance		Automatic/Manual			

<u>Magnification</u>	Automatic/Manual
Signal/Noise Ratio	≥50dB
Signal/Noise Ratio	Compound Signal 1.0Vp-p/75Ω

1.6 Pan/Tilt Functions

This product is a high-tech monitor and controller which incorporates high definition color camera, universal variable pan/tilt, infrared lighting, multi-functional decoder, character superimposing, alarm input/output into a whole, reduces interconnections to a great extent among parts in the system and rises up the reliability of the system. In addition it has advantages of easy installation and maintenance, beautiful appearance, lightweight and flexible, simple operation etc.

1.6.1 Integrated Multi-Protocol Decoder

- The built-in decoder integrates 16 kinds of communication protocols in maximum. The baud rate of communication is adjustable. It has strong universality and is compatible with multiple common systems only by simple setting on the dip-switch.
- RS485 serial control: addresses of the pan/tilt 1 – 1023.

1.6.2 Integrated Panoramic Pan/Tilt

Panning 360° continuously, manual pan speed 0° ~ 60°/s;
tilt range: -85° ~ 90°, manual tilt speed 0° ~ 40°/s.

- Smooth running at low speed with super lower noise. Images have no fluttering.
- Panoramic monitor without black spot and the positioning accuracy can reach ±0.1°.

1.6.3 High Degree of Intelligence

- Preset memory has as much as 128 positions. Data are kept in memory even power is failure.
- Horizontal scan between two positions are supported. Scan speed can be altered and direction of pan can be selected freely. The pan/tilt can make scan larger or smaller than 180° between any two positions with adjustable speed.
- Six groups of programmable patrol pattern are available with 16 preset positions each. The running speed and retained time for each preset position are adjustable respectively.
- Self-study function of pattern. The system can simulate the PTZ route of user's operation within 40 seconds and data are kept in memory even power is failure.
- Character superimposing function. It can display the address of the pan/tilt, title of the preset position etc.
- Long focus speed-limited function. The pan/tilt can adjust automatically the manual control speed depending on the focal length of the camera. The larger the magnification times, the slower the manual control speed thus to ensure searching the target rapidly and accurately.
- Integrated multiple protocols. A lot of communication protocols are integrated inside the pan/tilt

with selectable baud rates from 2400 bps to 19200 bps.

1.6.4 Camera Function: Refer to Camera

- Control Mode of Focal Length : the user can manually adjust the focal length of the camera.
- Control of Magnification : the user can “pull up” or “push away” the lens
- Backlight Compensation : in case the lit object has dark background and couldn't be displayed clearly, the user can switch on the backlight compensation .
- White Balance : in case images have distorted color on the screen, the user can set various kinds of modes by orders. There are six modes available for selection: indoor mode outdoor mode trigger mode auto tracking white balance manual white balance automatic mode.
- AE Mode : manual/automatic setup.
- Setup of Low Illumination : normally the camera operates under normal condition. In case when ambient illumination is lower than 1 LUX, the camera can automatically switch into zero illumination state . You can also make the camera under the zero illumination state manually.
- Other function: refer to different camera by using system menu to control.

1.6.5 Infrared System

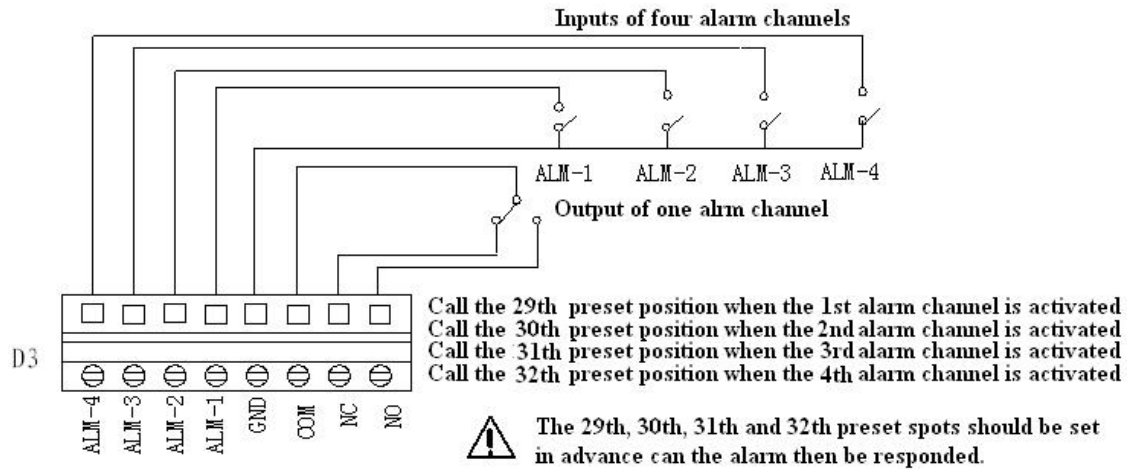
- The infrared system is normally under automatic control state. The infrared lamp shall act followed by open/close of the low illumination of the camera;
- The open/close state of the infrared lamp can be changed by the menu manually;
The default option on the menu of the infrared lamp is OFF. Normally the system detects external illumination and opens/closes the infrared lamp automatically. If the user changes the option of the infrared lamp into ON, the infrared system is changed into the manual control; if changing back into the automatic control, the user should set the option on the menu of the infrared at OFF.

1.6.6 Alarm Input/Output

- Four normal-open alarm inputs and close alarm.
- One group of the alarm output: normal-open and normal-close style.

When the system identifies the alarm signal, it can start the pan/tilt and the camera immediately as per the setup of the program, and switch the image in the alarm zone into the main monitor, adjust the position of the alarm position, monitor the preset position and reflect conditions of the alarm zone as fast as it can.

- See picture one



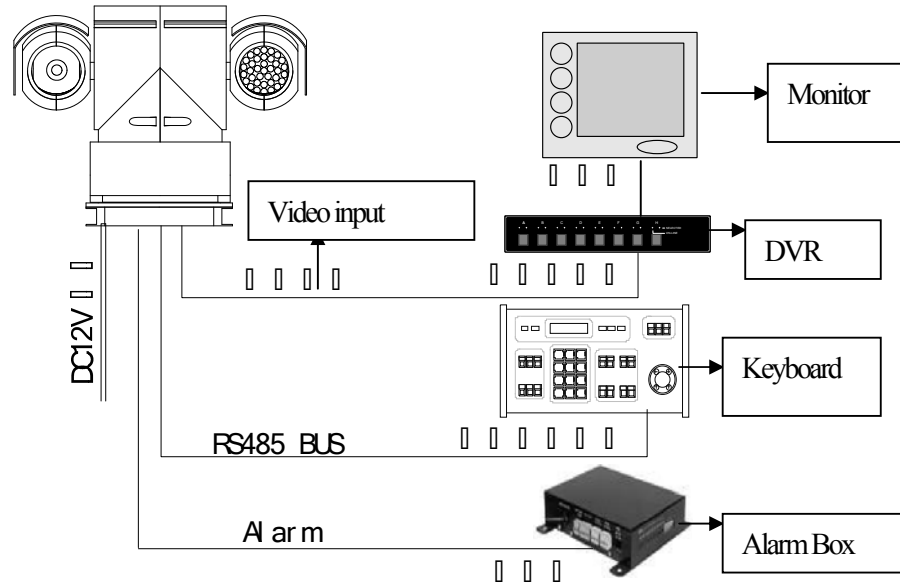
Picture one

The alarm input should be the input signal with the switch type. Any other types of the input signal (such as voltage signal) could damage the dome camera. In case multiple channels have alarm signals, the pan/tilt shall response upon them on by one with the interval of 2 seconds. The pan/tilt shall do not response upon functions such as “pan”, “patrol” and “self-study” when the alarm signal in inputted.

The second chapter Setup of the Menu of the Pan/Tilt

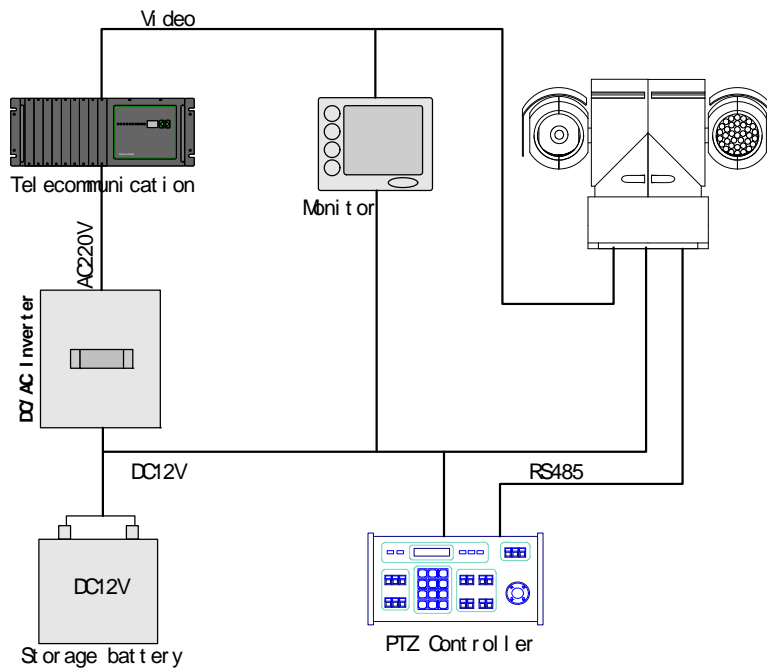
Schematic Drawing of Pan/tilt :

1) Schematic Drawing of the Vehicle-Carried Pan/Tilt (the shock absorber is added), see picture 2:



Picture 2

2) Schematic Drawing of Common Pan/tilt, see picture 3:



Picture 3

1. 2.1 Basic Operation of the Menu

Open the main menu by the control keyboard or the matrix through the order “calling the 64th preset position” or the order in 4 seconds “calling the 1st preset position” in two fast and consecutive times. (There is no other control orders during the two calling times)

- When the menu is displayed on the screen, operate “TILT UP”, “TILT DOWN” to move the cursor to the option to be set; and operate “PAN LEFT”, “PAN RIGHT” to modify contents or order to enter into the said option.
- To speed up operation by making the joystick towards one direction for more than one second.
- All setup on the menu could not be lost even the power is failed.
- Special uses can be seen from the description of the menu.

➤ 2.2 Setup of the Menu

2.2.1 MAIN MENU

- DISPLAY SETUP : To enter into the sub-menu of the display setup which can set the ID display, title display of the presser position and the display of the camera itself.
- CAMERA SETUP : To enter into the sub-menu of the common data of the camera.
- CONTROL SETUP : To enter into the sub-menu of the control data of the pan/tilt.
- CAMERA MASK SET : To enter into the sub-menu of the control data of the camera mask.
- PROGRAM : To enter into the sub-menu of the enhance function of the menu.
- PAL CAMERA : PAL/NTSC To switch modes of PAL/NTSC, being identical with that of the camera.
- CAMDEFAULT SET : To recover to the default setup of the camera.
- RESET PT : To reset the system.
- EXIT : To exit the main menu.

MAIN MENU	
1.	DI SPLAY SETUP
2.	CAMERA SETUP
3.	CONTROL SETUP
4.	CAMERA MASK SET
5.	PROGRAM
6.	PAL CAMERA
7.	CAM DEFAULT SET
8.	RESET PT
9.	EXIT

2.2.2 DISPLAY SETUP

- when it is set at ON, the monitor shall display the address of the pan/tilt such as “CAM 001”. The default is ON when power supply is switched

DI SPLAY SETUP	
1.	ID DI SPLAY ON
2.	ID POS TOP-L
3.	TITLE DIS ON
4.	TITLE POS 01
5.	CAM DI SPLAY ON
6.	PT ANGLE ALWAYS
7.	RETURN

on.

- ID POS : to set the display position of the pan/tilt, which can be at four corners of the screen such as TOP-L (upper left), TOP-R (upper right), BOTT-R (bottom right) and BOTT-L (bottom left).
- TITLE DIS : when it is set at ON, the title of the preset position can be displayed on the left side of the screen when calling the preset position, such as ‘NO.001 ABCDEFGH’. If no title of the position, then only ‘NO. 001’ is displayed. The modification of the title of the preset position can be set at the PROGRAM option on the menu.
- TITLE POS : To set the display position of the title of the preset position from the 1st line to the 10th line. The 1st line is at the top of the screen.
- CAMDISPLAY : when it is set at ON, the display of the camera itself can be opened.
- PT ANGLE: Coordinate function. ON-Open/OFF-Close/ALAWYS-Open always.
- RETURN : To return to the main menu.

2.2.3 CAMERA SETUP

- SLOW SHUTTER : frame accumulation function with options of manual/automatic. Under automatic state when the display of the camera is opened, ASS shall be displayed on the screen. (Only Sony camera can display ASS)
- BACK LIGHT : backlight compensation open/close.
- ICR SHOT : low illumination. ON – manual / AUTO – automatic.
- D-ZOOM : To set up digital zoom. ON – open / OFF – close.
- EXP COMP : Exposal compensate, ON-open/OFF-close.
- COMP VALUE : Exposal compensate value.-7 ~ 7 , -7 is the darkest, 7 is the brightest
- WB SET : White balance setup. ATW-Tracking automatically/Indoor/outdoor/one push/auto/menu
- WDR : WDR model ON-Open/OFF-Close(For SONY1010、VK654 Camera).
- RETURN : To return to the main menu.

CAMERA SETUP	
1. SLOW SHUTTER	AUTO
2. BACK LIGHT	OFF
3. ICR SHOT	AUTO
4. D - ZOOM	ON
5. EXP COMP	ON
6. COMP VALUE	7
7. WB SET	ATW
8. WDR	ON
9. RETURN	

2.2.4 CONTROL SETUP

- ALARM : ON/OFF Turn on or Turn off the alarm input function.
- HOME OPTION : To enter into the sub-menu of automatic home function.
- IR_LED: The default option on the menu of the infrared lamp is OFF. Normally the system detects external illumination and opens/closes the infrared lamp automatically. If the user changes the option of the infrared lamp into ON by the menu, the infrared system is changed into the manual control; if changing back into the automatic control, the user should set the option on the menu of the infrared at OFF.
- WIPER : Wiper control options, cooperate with wiper mode, control wiper moment or continuous operation.
- WIPER MODE : select wiper mode, continuous or moment mode to be selected.

CONTROL SETUP	
1. ALARM	ON
2. HOME OPTION	
3. IR-LED	OFF
4. WIPER	OFF
5. WIPER MODE	
6. DEFOGGER	OFF
7. RETURN	

Continuous mode is the default mode.

DEFOGGER : demist control options, once the function is opened, system is opened 3 minutes automatically, is closed after 3 minutes.

RETURN : To return to the main menu.

2.2.5 HOME OPTION

- AUTO HOME : When it is set at ON, the automatic home is opened. It means if the user has no any function in a period of time, the pan/tilt shall return home (HOME). The pan/tilt couldn't return home automatically if the pan/tilt is at patrol state. If no home returning is needed when the pan/tilt is under stop state, set this option at OFF.
- HOME POS : HOME is the returning position. If some scene is needed to set as HOME, call this scene on the camera and set it as the preset position 3, then call up the menu and enter into this sub-menu, and change the figure after HOME POS into 3. If you need to activate the automatic home, do not forget to set AUTO HOME at ON. HOME POS can be preset positions from 1 to 50.
- DWELL TIME : To set the time of automatic home, that is, if no control within the set time, it shall

HOME OPTION	
1. AUTO HOME	ON
2. HOME POS	01
3. DWELL TIME	05 M N
4. RETURN	

return home. The time can be from 1 to 99 minutes.

- RETURN : To return the menu one level upward.

2.2.6 CAMERA MASK SET

- MASK PRIVACY : ON-open/OFF-close.
- MASK SHADE Set the mask area color: BLACK/GRAY/WHITE.
- MASK REGION : Edit the mask area.
- RETURN : To return to the main menu.

CAMERA MASK SET

1. MASK PRIVACY ON
2. MASK SHADE BLACK
3. MASK REGION 01
4. RETURN

2.2.7 PROGRAM

- AUTO PAN START POS : to set the start position of the pan between two positions. After entering you can move the dome camera by the joystick. Push CLOSE button you can store current position and return.
 - ◆ RETURN : To return to the main menu.

PROGRAM

1. AUTO PAN START POS
2. AUTO PAN END POS
3. RUN AUTO PAN SLOW
4. SET
5. SET
6. RUN
7. REC
8. RUN
9. RET

PROGRAM

1. AUTO PAN START POS
2. AUTO PAN END POS
3. RUN AUTO PAN SLOW
4. SET TITLE 01
5. SET PATROL 01
6. RUN PATROL 01
7. RECORD PATTERN
8. RUN PATTERN
9. RETURN

- AUTO PAN END POS : to set the end position of the patrol between two positions. After entering you can move the pan/tilt by the joystick. Push CLOSE button you can store current position and return.
- RUN AUTO PAN : to pan between two positions. Please set the start position and the end position of the pan first. If the start position is just the end position, the dome camera shall make 360° pans. The speed of the pan is divided into six grades: FAST / NORMAL / SLOW / -FAST / -NORMAL / -SLOW. The first three grades are the pan less than 180° while the rear three grades are the pan larger than 180°. Adjust speed by PAN LEFT/PAN RIGHT and press OPEN button to exit the menu. The start position and the end position of the pan can be set up by options 1 and 2 of the menu.
- SET TITLE : to pan between two positions. Please set the start position and the end position of the pan first. If the start position is just the end position, the dome camera shall make 360° pan. The speed of the pan is divided into six grades: FAST / NORMAL / SLOW / -FAST / -NORMAL / -SLOW. The first three grades are the pan less than 180° while the rear three grades are the pan larger than 180°. Adjust

speed by PAN LEFT/PAN RIGHT and press OPEN button to exit the menu. The start position and the end position of the pan can be set up by options 1 and 2 of the menu.

- SET PATROL : To run patrol of multiple positions. Select the number of the pattern by PAN LEFT/PAN RIGHT and press OPEN button to exit the menu.
- RUN PATROL : To run patrol of multiple positions. Select the number of the pattern by PAN LEFT/PAN RIGHT and press OPEN button to exit the menu.
- RECORD PATTERN : To edit self-study of patrol. It can remember PTZ operation in 40 seconds in maximum. When the 40th second is up or press CLOSE button, the edit is terminated.
- RUN PATTERN : To run self-study pattern. After running it shall exit the menu. Control the joystick to terminate its running.
- RETURN : To return to the main menu.

2.3 Appendix to the Menu

2.3.1 Operation of Multiple Patrol Positions under Edit State. After entering into Edit state, operations on the screen are as follows:

NO	POS	SP	TM	POS	SP	TM
01	001	01	01	002	01	01
03	003	01	01	004	01	01
05	--	--	--	--	--	--
07	--	--	--	--	--	--
09	--	--	--	--	--	--
11	--	--	--	--	--	--
13	--	--	--	--	--	--
15	--	--	--	--	--	--

NO - No. of Patrol Position
 POS - No. of Preset Position
 SP - Leaving Speed
 TM - Dwell Time

After entering into Edit state, following information displays on the screen:

EDIT AREA: one line includes data of two patrol positions

SEQ:01 - It means current set sequence is 1
 CLOSE:EXIT - Press CLOSE to exit Edit state

The prompt messages are displayed on both top and bottom lines and information of every pattern is displayed in the middle of the screen. One line includes data of two patrol positions. Move the cursor by PAN LEFT/RIGHT and change values by TILT UP/DOWN. Press down buttons for more than one second to speed up operation. Press CLOSE button to exit the Edit state and store the revisions. The program can search the first position where POS is "--", and store data in front of it and regard data after it ineffective. Look the above drawing for example, the program stores first four patrol positions. The settable range of

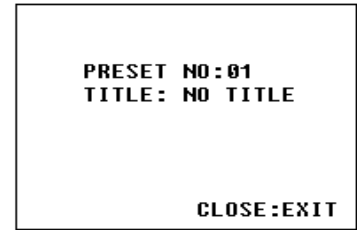
POS is from 1 to 63 and 65 to 128. When POS is “—“, it means the range of the patrol is finished. The settable range of SP is from 0 to 8 (0 is the same with 1 and has the fastest speed while 8 has the lowest speed). The settable range of TM is from 0 to 99 seconds.

2.3.2 Operation of Title of Preset Position under Edit State.

After entering into Edit state, the display on the screen is shown as follows:

from the drawing we can find the current setup is the first preset position with the title of “NO TITLE”. Move the cursor by PAN LEFT/RIGHT and change values by TILT UP/DOWN. Press down buttons for more than one second to speed up

operation. Press CLOSE button to exit the Edit state and store the revisions. The title of the preset position can include 8 characters in maximum such as 0-9, A-Z, +, - and blank. Note: the first letter should be 0-9 or A-Z, otherwise it means the title of the preset position should be deleted. When calling the preset position, it only displays “NO.XXX” without the title.



The third chapter Setup of the Intelligence Full-Dome Pan/Tilt

Before installing the product, first of all confirm the communication protocol and the baud rate of the main machine in the system, then set the dip-switch SW2 of the pan/tilt to be identical with that of the system, set the address of the pan/tilt on SW1 and the type of the communication protocol and the baud rate on SW2.

3.1.1. Terminal Resistor :

The jumper JP1 is the option switch of 120 Ω terminal resistor of the bus RS485. When it is at 2—3 state, 120 Ω terminal resistor is opened and no bus 485 is connected; when it is at 1—2 state, 120 Ω terminal resistor is connected in parallel with the bus 485. In the bus RS485 system, there is only one pan/tilt, which has the terminal resistor to be connected in the circuit and other pan/tilts whose terminal resistors are opened so as to increase the reliability of the system. Generally, the terminal resistor of the pan/tilt at the farthest end from the control circuit is connected and all terminal resistors of other devices are opened.

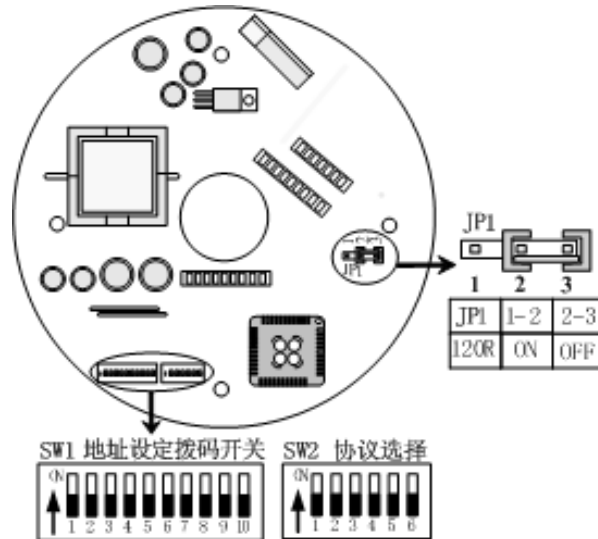


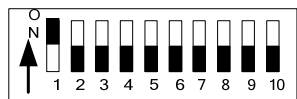
图 1

3.2 Dip-Switch of Address :

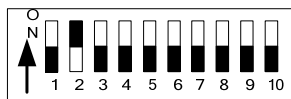
SW1 is used to set the addresses of the pan/tilt which has the range from 1 to 1023. From DIP-10 to DIP-1 it corresponds to a binary number with 10 bits in which the highest bit is DIP-10 and the lowest bit is DIP-1. The state ON for each bit means 1 while the state OFF means 0. The encodes of some addresses are as follows:

Dome Address	States of Dip-Switch									
	DIP-1	DIP-2	DIP-3	DIP-4	DIP-5	DIP-6	DIP-7	DIP-8	DIP-9	DIP-10
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
...	...									
1023	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON

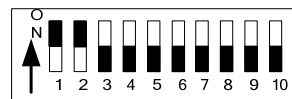
For example :



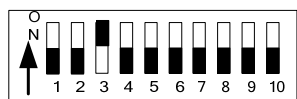
Speed Done Address=1



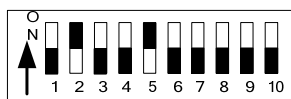
Speed Done Address=2



Speed Done Address=3



Speed Done Address=4



Speed Done Address=18



Speed Done Address=1023

3.3 protocol and default baud rate setup

SW2 is used to set the communication protocol and the baud rate used by the pan/tilt. Bits from DIP-4 to DIP-1 of the SW2 are used to select the protocol and 16 different protocols can be selected in maximum. The encoded table of the protocol selected by the pan/tilt is as follows:

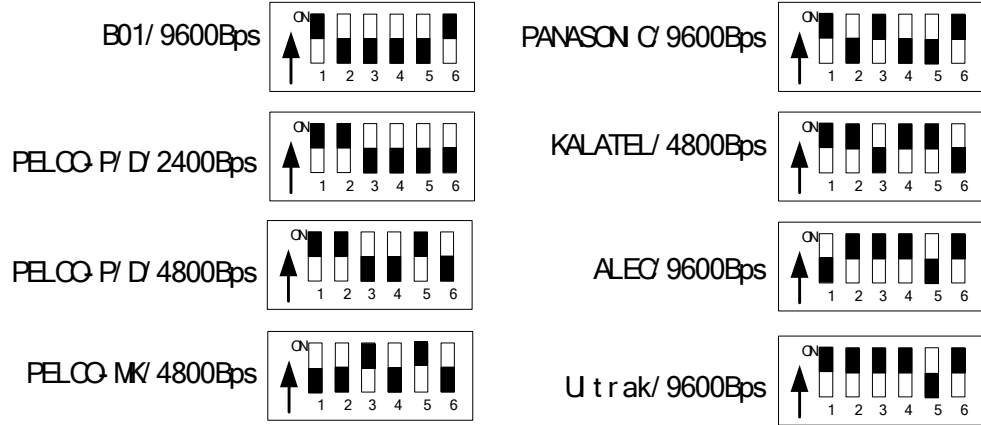
Type or Protocol	Selection of Communication Protocol				Normal Baud Rate	
	DIP-1	DIP-2		DIP-1	DIP-2	
SAMSUNG	ON	OFF	OFF	OFF	OFF	ON
B01	ON	OFF	OFF	OFF	OFF	ON
NEON	ON	OFF	OFF	OFF	OFF	ON
SANTACHI	OFF	ON	OFF	OFF	OFF	ON
PELCO-P/D	ON	ON	OFF	OFF	OFF	OFF
PELCO-MK	OFF	OFF	ON	OFF	OFF	OFF
PANASONIC	ON	OFF	ON	OFF	OFF	ON
LONGCOMITY	OFF	ON	ON	OFF	OFF	ON
HUNDA600	ON	ON	ON	OFF	OFF	ON
LILIN	OFF	OFF	OFF	ON	OFF	ON
VICON	ON	OFF	OFF	ON	ON	OFF
MOLYNX	OFF	ON	OFF	ON	OFF	ON
KALATEL	ON	ON	OFF	ON	ON	OFF
VCL	OFF	OFF	ON	ON	OFF	ON
RESERVED	ON	OFF	ON	ON	OFF	ON
ALEC	OFF	ON	ON	ON	OFF	ON
ULTRAK	ON	ON	ON	ON	OFF	ON

3.4 Setup of the Baud Rate of Communication of the Pan/Tilt (later 2 bits of SW2)

Position of Dip-Switch BaudRateof Communication	1	2	3	4	5	6
2400bps					OFF	OFF
4800bps					ON	OFF

9600bps					OFF	ON
19200bps					ON	ON

Schematic Drawing of Dip-Switch for Reference :



The fourth chapter Installation of the Product

4.1 safe measure

4.1.1 Competency requirement to install or maintain

- Take on the qualification on CCTV installation or maintain, and qualification of relative work (such as high air work and so on), must have the rudimentary knowledge and operation skill as follows;
- Have rudimentary knowledge and operations skill on CCTV systems and makeup parts;
- Have rudimentary knowledge and operation skill on low pressure routing and electric line connection.
- Have capacity of knowing the manual

4.1.2 Requirements on rise and fall device

Use safe rise and fall device which fits for installing place and PTZ installing way.

Rise and fall device can reach the enough height

Rise and fall device should has safety capability.

4.2 Warning

1. Please read the manual operation carefully before installing.
2. There are two input ways of power supply: DC12V (vehicle) and AC24V (normal pan/tilt). Detailed connections refer to the description files.
3. There are sophisticated optical and electronic components inside the product. Avoid incorrect operation methods such as heavy pressing or strong vibration during the course of transportation, store and installation otherwise the product could be damaged.
4. Please do not dismount components inside the product to avoid occurrence of trouble. There is no part inside the product, which needs repair by customer himself.
5. Observe all electric safety standards in application and adopt special power supply attached the product. RS-485 control signal and video signal should be kept enough distance with the high voltage devices and cables during the course of transmission, and take protection measures such as anti-lightning and surging etc. if necessary.
6. Do not apply the product under the state exceeding limited temperature, humidity or specifications of power supply.
7. Do not aim the camera at the sun or very bright object, aim or monitor bright and still object for a long time whether the power supply of the camera is switched on or off.
8. Clean out dirt with special lens tissue if dust is stuck on the lens.

4.3 Environment request

Temperature: -35℃ ~ 55℃, Humidity: 90%

Power supply: DC12V/5A (Vehicle), AC24V/2.5A (Normal)

4.4 Routing safe

There must be more than 50 meters between signal transmission line and high voltage cable routing inside should be the best long eave, in hollow place must adopt sealed tube inter ground routing, and adopt one point to the ground to the tube, do not adopt routing in air in strong thunderstorm or high inductive pressure area (such as high pressure transformer substation), must adopt extra high power defend lighting equipment and install lightning rod and so on measures.

- Outdoor equipment and design on routing of defend thunder and earth should be considered uniformly, connecting requirement on building defend thunder and accord with relative national, industry standard requirements.
- System should earth equal to electric bit, earth equipment must satisfy the double requirements of system anti-jamming and electric safe, and don't short connect or mix connect with strong electric net zero line. When system earth separately, earth resistance is no more than 4Ω , section squares of earth lines must no more than 25mm^2 line short connect.

The product adopt TVS plate lightning strike technology, can prevent damage to instantaneous lightning strike, surge and so on kinds of pulse signal of lower than 1.5KW power efficiently. But, about install indoor, should to do necessary defense measures under the premise of assuring electric safe:

4.5 installation prepare

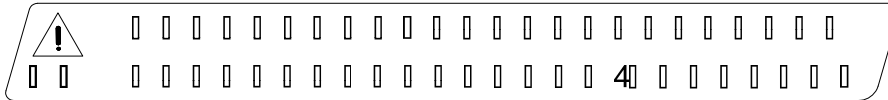
4.5.1 Basic requirement

- all electric work must obey the used newest electric rule, fireproofing rule and relative rules;
- Check all accessories along products are complete, make sure the apply station and installation way of P/T/Z are accord with requirements. If not, please contact supply;
- Please use this product accord to using environment.

4.5.2 Check installation space and place structure strength

Make sure installation place can acceptance this product and installation structure enough space.

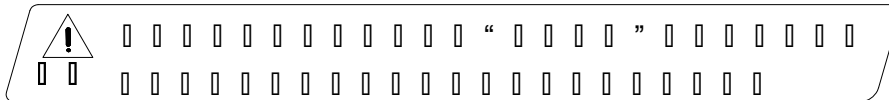
4.5.3 check installation space construction strength



Remark: make sure wall of installation, bracket must can bear total weight of P/T/Z and installation structure; having 4 speed times safe coefficient is required!

4.5.4 Setup dial switch

Setup dial switch according to control protocol and P/T/Z address (refer to P/T/Z parameter setup).



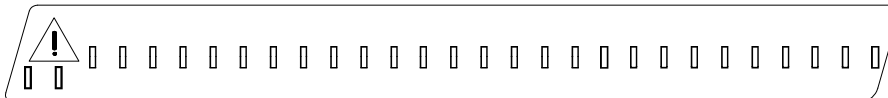
Remark: before install P/T/Z, make sure referring to parameter in “P/T/Z setup”, first do the setup of P/T/Z baud rate, control protocol and P/T/Z address!

4.5.5 self-inspection of P/T/Z after electric

to make sure P/T/Z can run normally in installation place, before installing, please insert P/T/Z system control line, video line, power line into relative sockets (line way according to specification on system control line, video line, power line remarks strictly) to do self-inspection after electric, P/T/Z will carry out default setup, do normal installation after self-inspection is ok.

4.5.6 Please keep all packing documents in P/T/Z

After open P/T/Z packing, please keep original packing documents in P/T/Z well in order to packing P/T/Z well with these packing material to mail to agent or manufacturer to repair when P/T/Z has problem.

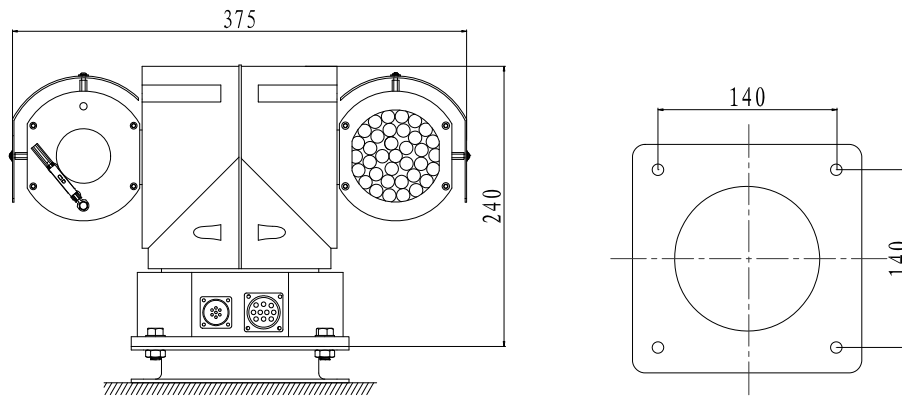


Remark: no original packing material cause accident damage during delivery will generate extra fee!

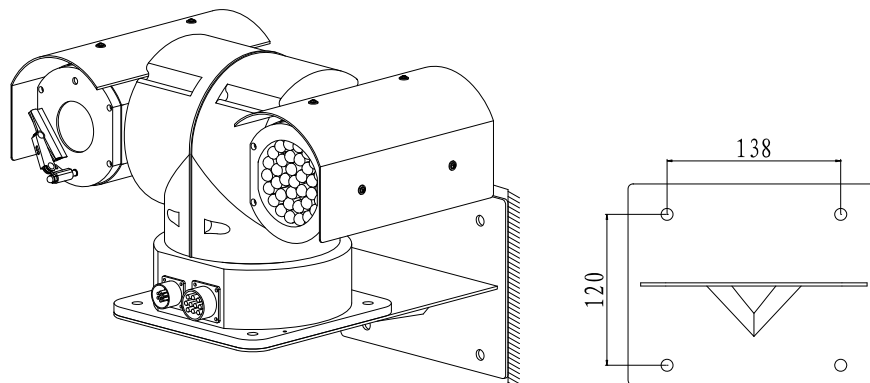
4.6 Installation Style of the Product

Infra red high speed P/T/Z system installation style is separated into two modes: Vehicle –Carried installation mode and wall installation

Mode.



A、 Vehicle-Carried installation mode



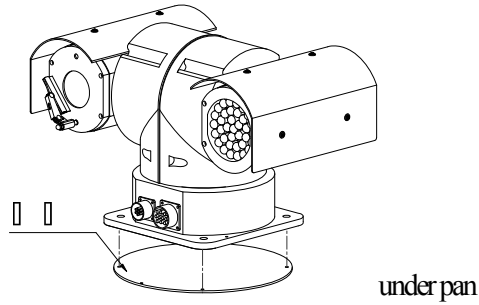
B、 wall installation mode

About the 2 kinds of installation mode, detailed spec is appeared on the subsequent part in the manual operation.

4.7 Installation spec

Prepare:

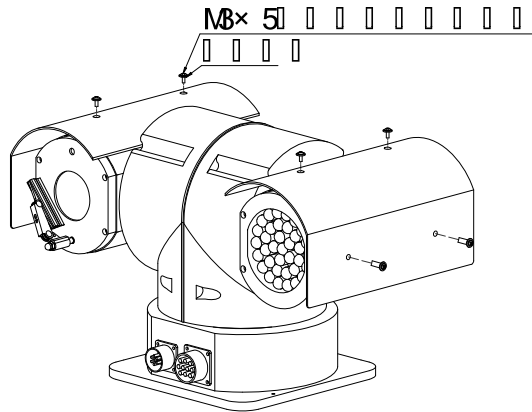
- 1) Remove the bottom plate of the pan/tilt;
 - 2) Set the corresponding information in accordance with the schematic drawing of the dip-switch of addresses, protocols and baud rates;
 - 3) Install the bottom plate of the pan/tilt and take care of the tightness of waterproof seal ring;
- (see picture 2) ;



Picture 2

4.7.1 Cover installation:

- 1) Take out 4 M3×5 crossed stainless steel screws and 4 3.2×8×0.7 four fluorine washers and housing from accessories.
- 2) Fix the housings at the hoist pole in frame at two sides with 4 M3×5 crossed stainless steel screws and 4 3.2×8×0.7 four fluorine washers (one screw corresponds one washer) (see picture 3)

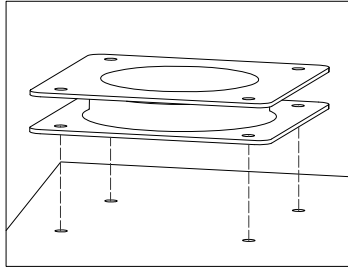


M3 x 5 crossed stainless steel screw ,
four fluorine washer

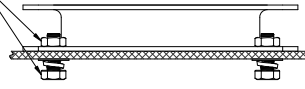
Picture 3

4.7.2 Vehicle-carried installation

- 1) Take out the Vehicle absorber, take the underpan as templet, drill four installation holes on the bracket which needs be installed. (see picture 4)..
- 2) Prepare 4 the right length bolts according to your request, fix the absorber with flat pillow and flip pillow, see picture 5;



客户自备



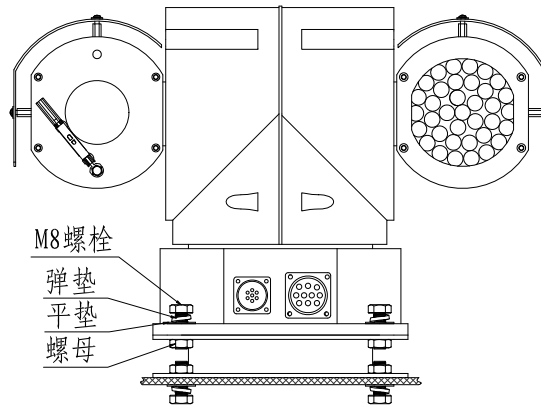
prepared by user

himslef

picture 4

picture 5

- 3) Fix the absorber at the under pan of P/T/Z with 4 M8 x 30 stainless steel bolts and one flip pillow , one flat pillow, see picture 6



M8 bolt

Flip pillow

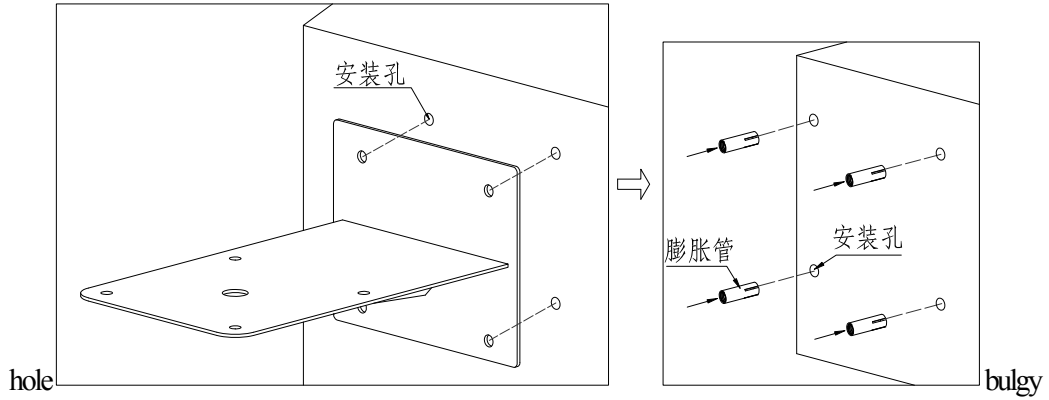
Flat pillow

nut

Picture 6

- 4.7.3 Wall installation 51) Take the wall bracket out of packing, use the under pan as templet, drill 4 M8 metal bulgy bolt holes on the surface with strike electric drill, fit on bulgy tube separately (see picture 7);
- 1) Take the wall bracket out of packing, use the under pan as templet, drill 4 M8 metal bulgy bolt holes on the surface with strike electric drill, fit on bulgy tube separately (see picture 7);

Installation

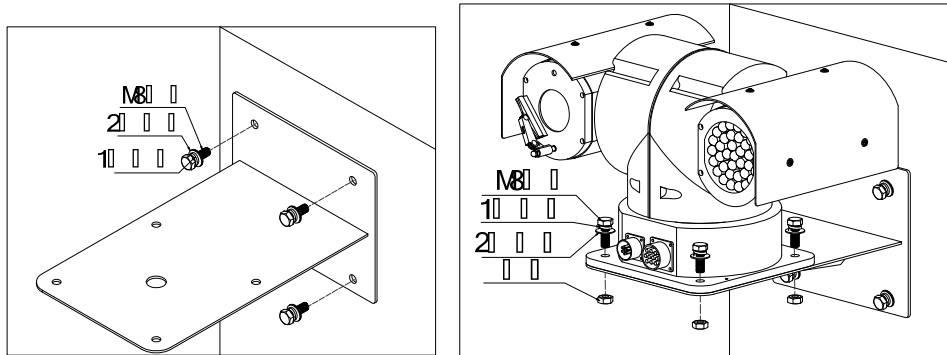


tube, installation hole

picture 7

2) take P/T/Z out of packing, thrill through bracket with control line, video line, power line, and fix the bracket on the wall with 4 M8 bolts and one $\phi 8$ flip pillow, 2 $\phi 8 \times \phi 18$ stainless steel flat pillows (see picture 8);

3) Then fix P/T/Z on the wall bracket with 4 M8 x 30 stainless steel bolts and flat pillow, flip pillow, nuts (see picture 9).

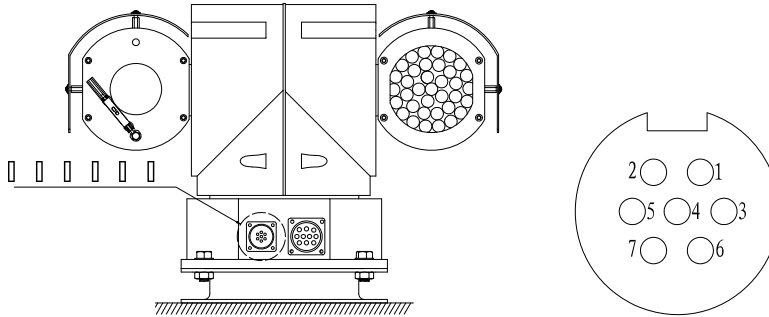


Picture 8, M8 bolts,
2 flat pillow, 1 flip pillow

picture 9 M8 bolts, 1 flip pillow,
2 flat pillow, nuts

4.8 p/t/z line out way

4.8.1 Description of 7-Core Terminal see picture 10:

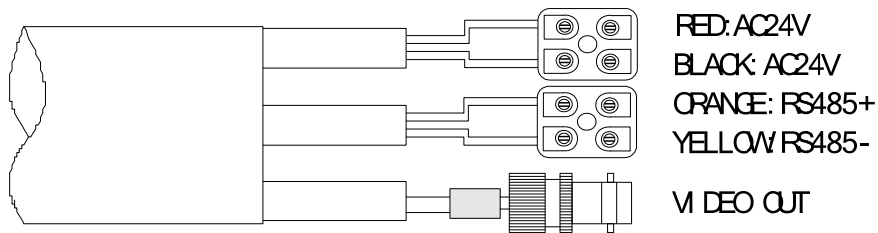


Description of 7-Core Terminal picture 10

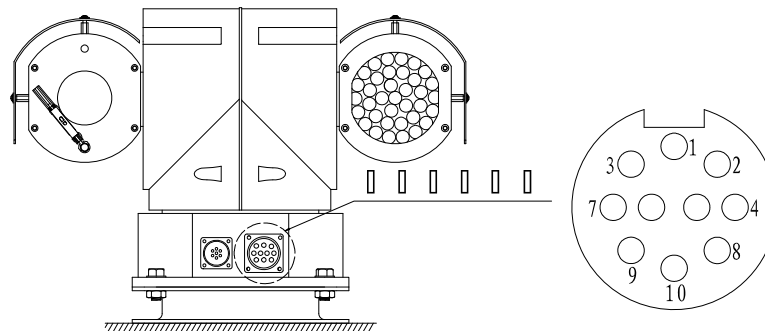
Description:

S.N.	MEAN
1 .	DC12V(AC24V): RED
2 .	GND(AC24V): BLACK
3 .	R- (communication-): YELLOW
4 .	Null
5 .	R+ (communication+): ORANGE
6 .	V+: (VF+)
7 .	V-: (VF-)

✧ **Description of 7-Core Terminal line out**



4.8.2 **Description of 10-Core Terminal** see picture 11 :



Description of 10-Core Terminal picture 11

decription:

S.N.	MEAN
1 .	Alarm-1 in: RED
2 .	Alarm-2 in: ORANGE
3 .	Alarm-3 In: YELLOW
4 .	Alarm-4 In: GREEN
5 .	NC
6 .	Alarm In COM: BLACK
7 .	Alarm Out COM: WHITE
8 .	NC
9 .	Alarm NO out: BLUE
10 .	Alarm NC COM: GREY

Remark:10-Core Terminal is used for alarm system, detailed line refer to connect pole color spec!

Appendix □ Normal Troubles and Remedies

Troubles	Possible Causes	Remedies
No action and images after switching on	Power supply damaged of insufficient electric power	Replace
	Wrong connection of power supply wires	Make correction
	Engineering circuits failed	Repa i r e
Abnormal self-inspection, images with humming of motor	Mechanic trouble	Repair
	Pan/tilt may be inclining	Re-fix
	Insufficient electric power	Replace with qualified power supply
Normal self-inspection, no images	Wrong connection of VF circuit	Make correction
	Bad contact of VF circuit	Remove
	Camera damaged	Replace
Successful self-inspection without control	Wrong connection of control signal wires	Make correction
	Mismatched address	Re-select
	Mismatched protocol	Make mismatch of protocol and controller and restart
Unstable images	Bad contact of VF circuit	Remove
	Insufficient electric power	Replace
	Abnormal self-inspection	Restart
	Bad contact of control circuit	Remove
Dome pan/tilt out of control	Operation of main machine has problem	Restart the main machine
	Much load or communication distance too far	1 . Connect 120Ω resistor of the farthest dome pan/tilt from the controller and disconnect all other resistors; Add coding divider
Auto/Manual of infrared lamp ineffective	Infrared lamp may be damaged	Rework

Some common troubles and their causes and remedies are listed above for your reference. Should

you meet other special problem, you can contact with the dealer directly for technical support.

Appendix □ : Relation form between 24VAC routing and communication distance

When routing is confirmed, 24VAC pressure is lower than 1 0 % , the largest communication distance recommended. (for equipments supply AC, the biggest pressure waste rate allowed is 1 0 %). For example: the rated power of one equipment is 80VA , the needed smallest routing is 0.8000mm when be installed 35inch form transformer .

Trans. dis. feet(m)	Routing (mm)			
	0.8000	1.000	1.250	2.000
10	283 (86)	451 (137)	716 (218)	1811 (551)
20	141 (42)	225 (68)	358 (109)	905 (275)
30	94 (28)	150 (45)	238 (72)	603 (183)
40	70 (21)	112 (34)	179 (54)	452 (137)
50	56 (17)	90 (27)	143 (43)	362 (110)
60	47 (14)	75 (22)	119 (36)	301 (91)
70	40 (12)	64 (19)	102 (31)	258 (78)
80	35 (10)	56 (17)	89 (27)	226 (68)
90	31 (9)	50 (15)	79 (24)	201 (61)
100	28 (8)	45 (13)	71 (21)	181 (55)
110	25 (7)	41 (12)	65 (19)	164 (49)
120	23 (7)	37 (11)	59 (17)	150 (45)
130	21 (6)	34 (10)	55 (16)	139 (42)
140	20 (6)	32 (9)	51 (15)	129 (39)
150	18 (5)	30 (9)	47 (14)	120 (36)
160	17 (5)	28 (8)	44 (13)	113 (34)
170	16 (4)	26 (7)	42 (12)	106 (32)
180	15 (4)	25 (7)	39 (11)	100 (30)
190	14 (4)	23 (7)	37 (11)	95 (28)

200	14 (4)	22 (6)	35 (10)	90 (27)
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Appendix □ : Prevent lightning strike, surge

The product adopt TVS plate lightning strike technology, can prevent damage to instantaneous lightning strike, surge and so on kinds of pulse signal of lower than 1.5KW power efficiently. But, about install indoor, should to do necessary defense measures under the premise of assuring electric safe :

- There must be at least 50 meters between signal transmission line and high pressure equipment or high cables;
- Routing indoor select go along eave to the best;
- In empty skies, must adopt hermetic tube cover up in earth way to routing, and adopt one point, forbid routing in air absolutely;
- In strong thunderstorm or high inductive pressure area(such as high pressure transformer substation), must adopt extra power equipment and install lightning rod and so on measures;
- outdoor equipment and design on routing of defend thunder and earth should be considered uniformly, connecting requirement on building defend thunder ;
- system should earth equal to electric bit , earth equipment must satisfy the double requirements of system anti-jamming and electric safe, and don't short connect or mix connect with strong electric net zero line. When system earth separately, earth resistance is no more than 4Ω , section squares of earth lines must no more than 25mm^2

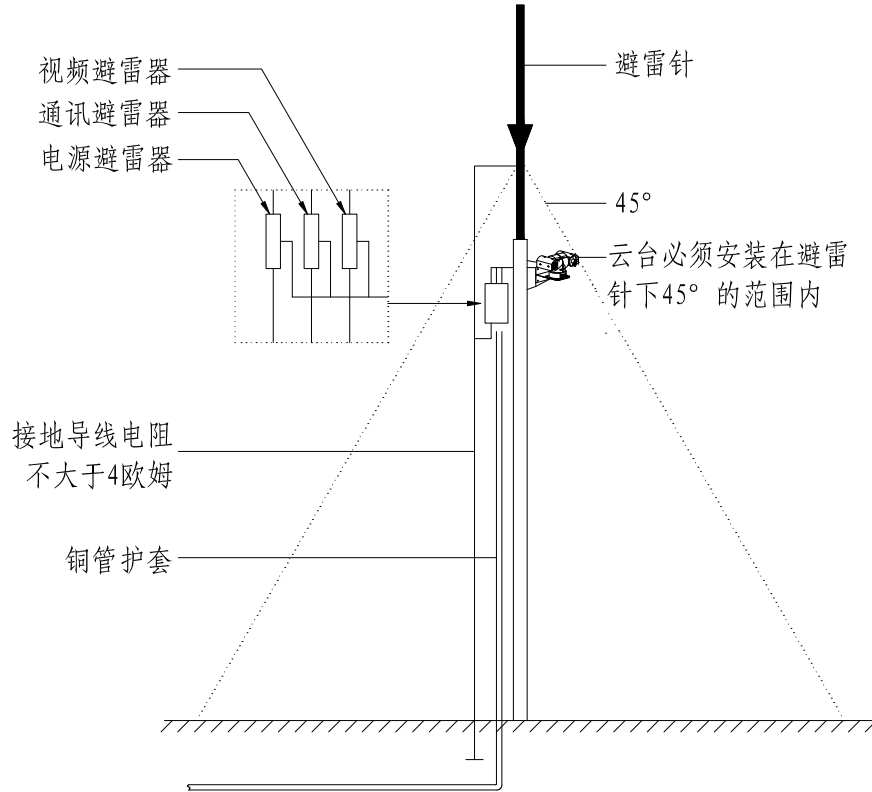


图12

Video lightning arrester, communication lightning arrester, power lightning arrester, lightning rod, P/T/Z must be installed in the around of 45° under lightning rod, earth resistance line is on more than 4Ω, steel pipe sleeve

Appendix □ : Maintenance service terms

1、Service range

- ◇ In one year the cargo sold, the problem is approved caused by product material or techniques defect, manufacturer will repair or replace for free;
- ◇ Warranty period of all parts which have repaired or replaced is 90 days after sending out cargoes;
- ◇ Products can't be repaired for free for manpower cannot dispute reason(such as war, earthquake, lightning strike),improper use, deviant operation, revise, normal fray or problem caused by accident;
- ◇ Manufacturer take on no responsibility on p damage and loss caused by product special use or application. The compensation on fell back, neglect or infringement about products will not over products value. Manufacturer won't take on any responsibility on special, sudden or continued damage caused by any other reason;

- ✧ Trouble products over warranty period, we do repay maintenance service lifetime.
- ✧ whole machine is repaired for free for 3 years(remark: camera module for 1 year)

2、Repair for free terms

Cargoes need repair during repair for free period, buyer connect manufacturer to get RAN, and provide product information below along with cargoes;

- ✧ Type and serial NO.;
- ✧ Delivery date, order NO., sale order NO. or manufacturer invoice;
- ✧ Detailed problem phenomenon

If having disputes on repair for free terms hereinbefore, please attach written explanations when returning products.

3、Return

For returning cargoes quickly, please contact manufacturer to get (repair NO.), then arrange sending cargoes to manufacturer. All returned cargoes should mark RAN clearly. Delivery way of returning cargoes is the same as way of delivery to manufacturer. Manufacturer only undertake the single freight of manufacturer send cargo to customer after repair.