Chapter 1: INSTALLATION MANUAL

1、FORWARD

This manual introduces the function, installation and operation of the integrated medium speed dome camera in details. Please thoroughly familiarize yourself with the information in this manual prior to installation.

This series dome cameras are equipped with DSP integrated camera, in-built zoom lens and decoder controller.

Protocol P/D is used in this series dome cameras. It can support most popular system platforms, such as: PELCO, MAXPRO. This manual will not explain the operation of other system if connecting with other system, please contact with the system manufacture or dealer.

2、SAFEGUARD AND WARNING

Prior to installation and use of this product, the following WARNING should be observed. This product can be only used in specified range in order to avoid any damage or danger.

- **Installation and servicing should only be done by qualified service personnel;**
- **It must not be installed where exposed to rain and moisture and it can not be used in unqualified temperature, humidity and power supply.**
- **Only use replacement parts recommended by us.**
- **After replacement/repair of this unit's electrical components, conduct a resistance measurement to avoid short circuit or turnoff.**
- **Please use the soft cloth to clean the dome. Use neuter cleanser if bad smeared. No use the strong or corrosive cleanser avoiding scuffing.**
- **Be cautious of moving, never press the drive parts heavily avoiding dome troubles.**
- **The installation materials should be capable of supporting four times the weight of the enclosure, pan/tilt, camera and lens combination.**

Please thoroughly read this manual prior to installation and operation.

3 .Structure of Dome Camera

3.1 Structure of Indoor Suspended Ceiling Dome Camera (See picture)

This series of Indoor suspended ceiling dome camera contains following parts. Inspect each box to make sure all parts are present.

Indoor in-ceiling dome camera contains following parts:

Back Box

Integrated Dome

Translucent Dome Cover

3.2、Structure of Indoor & Outdoor Suspended Dome Camera (See picture)

This series of Indoor & outdoor suspended dome camera contains following parts. Inspect each box to make sure all parts are present.

Indoor & outdoor suspended dome camera contains:

Back Box

Integrated Dome

Translucent Dome Cover

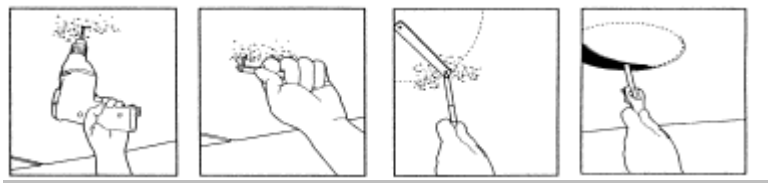
4、MAIN FUNCTION FEATURES：

- **Back box: Aluminum-alloy enclosure dome;6 inches polycarbonate**
- **Preset position:128**
- **Preset position accuracy: error less than 0.1º**
- **Control speed auto adjustment: control speed lowers down as the increase of focus lens depth**
- **Variable auto scan speed: take the latest pan speed as auto scan speed**
- **Pan running: 360 º continuous pan rotation**
- **Tilt running: unobstructed +2º~-92º tilt rotation**
- **Auto scan limit: Programmable Limit switch**
- **8 preset position tour function (preset position must be set)**
- **Control Protocol: Protocol P(compatible with Protocol PELCO-P)**
- **Control Protocol: Protocol D(compatible with Protocol PELCO-D)**
- **Baud rate：1200b、2400b、4800b、9600b**
- **Auto flip: make the dome pan rotate 180º from tilt to bottom**
- **Take low temperature and low consume technology to extend use life**
- **Capable to control multi- brand cameras**
- **Embed in surge and lightning protector.**

5、INDOOR IN-CEILING DOME CAMERA INSTALLATION

NOTE: The thickness of the ceiling must between 1.3CM and 5.0CM.

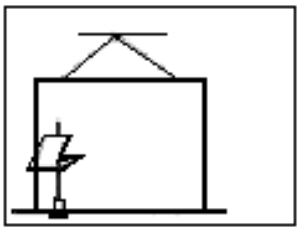
Step1 PREPARE CEILING

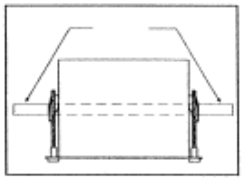


1. Locate the center point of the mounting location. Drill a hole in the ceiling with a drill.

2. Draw a circle on the ceiling using the compass tool and a pencil. Cut the circle of the ceiling.

Steps 2 INSTALL THE BACK BOX





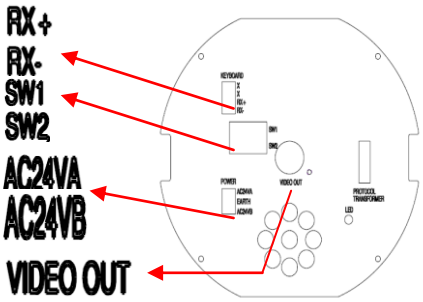
1. Install a safety chain that will support to 7.0Kg, and connect it to safety screw on upper dome.
2. Tighten the pinchcock on the dome, push it up by the hole in the ceiling until the pinchcock flick then tighten the snail.

STEP 3 INSTALL DOME DRIVER

1. Set address, protocol and baud rate for the dome. Please refer to appendix Ⅰ.
2. Connect the wiring, control lines and video lines.

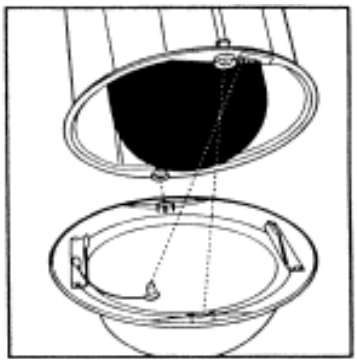
Refer to the picture

3.Line up the green and red tabs with the green and red labels. Push In on the tabs. Insert the side with green tab, then the side with red Tab. Continue pushing on the ends of the tabs until both sides click Into place.



STEP 4 INSTALL LOWER DOME

1. Snap the clip, on the end of the trim ring leash, into the hole on the lip of the box.
2. Line up the snaps on the trim ring with the mounting screw on the back box. Snap the trim ring into the plastic snap washers on the mounting screws.

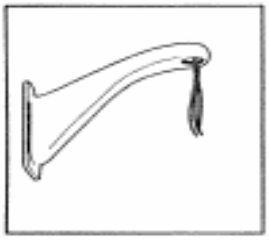


6、INDOOR/ OUTDOOR PENDANT DOME CAMERA INSTALLATION

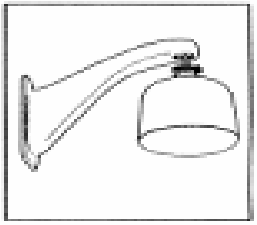
STEP 1 MOUNT AND INSTALL THE BACK BOX

NOTE: When outdoor installation, please make sure to airproof, damp-proof.

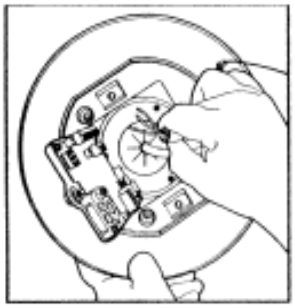
1. Install suspended bracket well conform to the manufacturer's instruction. Insert the video, control and power wires into suspended bracket, and fix the bracket
2. Turn the thumb screw and open the hinged door located inside the back box.



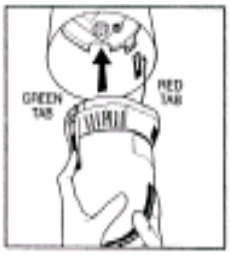
e mount into the back box.



4. Screw the back box into the mount. If outdoors, apply thread compound to the threads on the back box.



STEP2 INSTALL DOME DRIVE

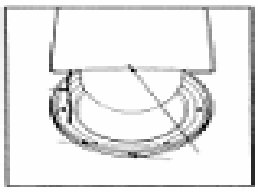


1. Connect the control wire, powder wire into the plugs of integrated dome camera.

2. Set the protocol, baud rate, address and camera type for the dome.

3. Line up the green and red tabs with the green and red labels. Push in on the tabs. Insert the side with the green tab, then the side with red tab. Continue pushing on the ends of the tabs until both sides click into place.

STEP3 INSTALL LOWER DOME



1. Attach the back trim leash to the lower dome. Use retainer screw (nearest to a mounting screw) inside lower dome.

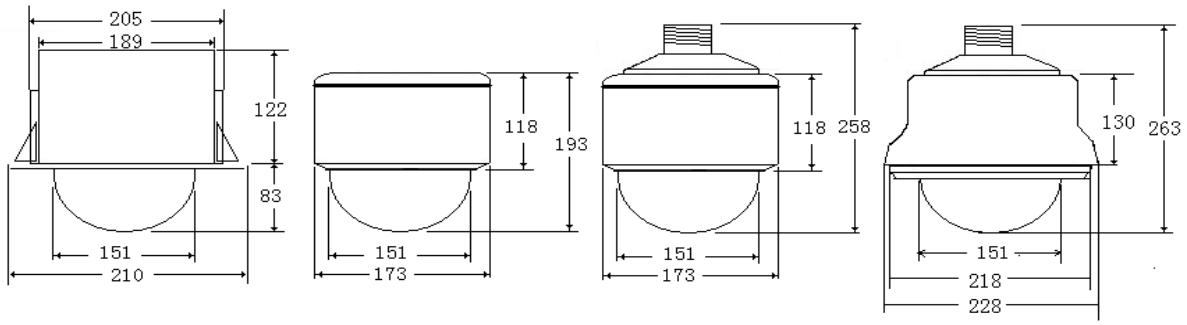
2. Push the lower dome inside the back box, line up the mounting screw holes, and install the two mounting screws.

7. Specification

7.1 Construction

Name	Integrated Medium Speed Dome Camera	Integrated Lower Speed Dome Camera
Back box	Aluminum-alloy	
Dome Driver	PC plastic	
Lower Dome	Polypropylene Transparent cover	
Weight		Unit Weight / Shipping Weight Indoor in-ceiling 4.5kg / 7.5kg Indoor suspended 5.0kg / 8.5kg Outdoor suspended 5.5kg / 9.0kg
Pan rotation	360º	
Tilt rotation	+2º~ -92º	
Manual control speed	Middle speed dome	Low speed dome
	pan：0.1º~120º/sec	pan：0.1º~60º/sec
	tilt：0.1º/sec-40º /sec	tilt：0.1º/sec-30º /sec
Output Voltage	18-30VAC;24VAC standard	
Output Power	12VA standard（without heater）	
Working Environment	Indoor/Outdoor	
Working Temperature	0ºC ~50ºC（Indoor）、-40ºC ~60ºC（outdoor）	

Dimension Drawing:



7.2 Camera, Lens parameters

The parameter below is just for examples, details according to the reference of manufacture's tech instruction.

Model	DIS-MD2200UT DIS-MD2200 DIS-LD2200UT DIS-LD2200	DIS-MD2201UT DIS-MD2201 DIS-LD2201UT DIS-LD2201	DIS-MD2300UT DIS-MD2300 DIS-LD2300UT DIS-LD2300	DIS-MD3500UT DIS-MD3500 DIS-LD3500UT DIS-LD3500	DIS-MD2700UT DIS-MD2700 DIS-LD2700UT DIS-LD2700
Optical Zoom	22	22	23	35	27
Electronical Zoom	10	10	12	12	12
Signal system	PAL				
Touring System	2:1 interleaved	2:1 interleaved	Between lines	1:1 interleaved	2:1 interleaved
CCD	1/4"CCD			1/4"HAD CCD	1/4"CCD
Horizontal Resolution	480TVL		540TVL		
Lens	F1.6 (f=4~88mm)	F1.6 (f=4~88mm)	F1.6 (f=3.6~82.8mm)	F1.6 (f=3.4~119mm)	F1.6 (f=3.25~88mm)
Focus	Auto/Manual First				
Minimum illumination	1/50 sec Shutter speed (Color)1.0Lux	1/50 sec Shutter speed (Color) 1.0Lux 1/3 sec Shutter speed (Color) 0.06Lux 1/1.5 sec shutter speed (B&W)0.02Lux IR	(Color)0.05Lux IR-Cut On (B&W)0.01Lux IR-Cut Off Night mode 0Lux IR	0.5Lux,1/5sec 0.01Lux,1/3sec Night mode 0 lux IR	Color: 0.003 Lux Normal, B&W:0.0001Lux (real time) Night mode (IR): 0lux
Sync system	Inner Sync/AC linear lock			Inner/outer sync	Inner Sync/ AC linear lock
Shutter Speed	Auto 1/50-1/30000	Auto 1/50-1/30000	Auto 1/1.5-1/30000	Auto 1/1.5-1/30000	Auto 1/50-1/10000
Iris Ctrl	Auto/ Manual first			Auto	Auto/ Manual first
Gain Ctrl	Auto/ Manual				
Video Output	1.0±0.2VP-P(75ohm,compound)			1.0VP-P compound output,75ohm	1.0±0.2VP-P(75 ohm,compound)
S/N Ratio	50dB			>50dB	50dB
White Balance	Auto/Manual				
WDR	NO	NO	YES	YES	NO

Chapter 2 OPERATION

1. BASIC FUNCTION EXPLANATION

Operate	Procedure
Pan/Tilt	1. To rocker control keyboard, camera will rotate to the operation direction if the rocker leans to one direction of up/down/left/right. The speed depends on the distance between rocker and center. The camera will move slowly to the operation direction if move the rocker lightly in one direction. The camera will speed to MAX. Speed of continuously move the rocker in one direction. The camera will stop when the rocker returns to the center. 2. To 2-dimension control keyboard, the camera will rotate to the operating direction if press direction key. The speed depends on the current speed code. To our keyboard, press any one of 1-9, and then press direction key. The pressed number key is the speed stage. The larger number it is, the higher speed will be. The camera stops action of release the key. 3. To computer software control, press the direction key of control, the camera will rotate to the operating direction. The speed depends on current speed code. Some software can implement continuous rotation and some only can implement dot movement. Please refer to the software instruction provided by the manufacture for detailed operations. This dome can do 3600 continuous pan rotation and $+2^0$~-92^0 vertical rotations. It will stop rotate when reaching tilt limit.
STOP SCAN	Preset 96(hit"9"+"6"+ "Preset")
PRESET TOUR	Preset 98(hit"9"+"8"+ "Preset")
AUTO SCAN	Preset 99(hit"9"+"9"+ "Preset")
ZOOM WIDE	1.Press the ZOOM WIDE button or turn the joystick clockwise until you have the picture you want 2.release the button or joystick
ZOOM TELE	1.Press the ZOOM TELE button or turn the joystick anti-clockwise until you have the picture you want 2.release the button or joystick
IRIS OPEN	Continuously press key OPEN to open iris and increase brightness gain
IRIS CLOSE	Continuously press key CLOSE to close iris and increase brightness gain
FOCUS NEAR	Continuously press key NEAR, focus become near from far, the image becomes fog from clear or becomes clear from fog.

FOCUS FAR	**Continuously press key FAR, focus become far from near, the image becomes fog from clear or becomes clear from fog.**
PRESETS	**1. When set presetting, press "preset No."+ key "PRESET"(about for 3 seconds) 2. when use presetting, press "preset No."+ key "PRESET" 3. Please refer to operation instruction book for controller.**

Remarks:

The following stipulations are for presetting, no need to set. You can directly use it. Preset function (only for SONY and HITACHI camera)

Preset()	function
33	180º flip
34	lever home place
79	Open zoom on
80	Close zoom on
81	Auto low lux shift
82	Open law lux shift （B&W menu）
83	Close law lux shift （color menu）
84	Open wide dynamic
85	Close wide dynamic
86	Open Backlight Compensation
87	Close Backlight Compensation
88	Open video freeze
89	Close video freeze
92-93	Scan control limit
94	Exit menu
95	Enter menu
96	Scan stop
98	Preset tour
99	Auto scan

2. FUNCTION EXPLANATION

2.1 Screen menu function

It has screen menu function. All information can be displayed by menu to set the function and parameter (only for some camera)

2.2 Multi-cameras control function

Select different camera only by mending dial switch setting, no any hardware or software needed. It supports LG, HITACHI cameras.

2.3 Proportion speed function

Horizontal and tilt speed change automatically with the zoom changes. When zooming wide, the camera speeds down; then zooming narrow, the camera speeds up to catch better tracing effect.

2.4 AUTO SCAN

Auto scan refers to the function of 360^0 continuous scan the images at certain speed on the horizontal lever when keeping the pitching angle unchanged. The left and right limits can be set for continuous scan at certain speed on the horizontal lever.

2.5 AUTO FLIP

When the camera tilts downward and goes just beyond the vertical position, the dome rotates 180^0. When the dome rotates, the camera starts moving upward as long as you continue to hold the joystick in the down position. Once you let go of the joystick after the dome rotates, joystick control returns to normal operation. The auto flip function is useful for following a person who passes directly beneath the camera.

2.6 PRESET

Any position of dome camera PTZ can be conserved. We call it preset (pre-established position). The preset can be transferred and cleaned.

2.7 PRESET TOUR

The dome camera will transfer pre- established preset 1-8 every 20 second. It will leap over to next preset position if position in not among 1-8.

2.8 ZERO TEST

The dome camera will turn to horizontal and tilt zero by preset 34 when the inevitable desynchronizing appears or the operator wants to find zero position during working process. It can reset the orientation and is convenient for operators.

2.9 LOW PHAROSAGE (COLORS/BLACK AND WHITE SWIFT) FUNCTION

The camera automatically changes CCD pharosage according to surrounding light. Color image changes to black& white one in low pharosage; black& white image changes to color one in high pharosage.(related to camera)

2.10 AUTO FOCUS MODE

The camera automatically adjusts lens focus to keep clear image if auto focus mode. Manually operate FAR or NEAR focus adjustment can also adjust focus. The dome camera will recover auto focus adjustment function if operate horizontal, vertical rotation or control lens zoom.

2.11AUTO IRIS FUNCTION

The camera automatically adjusts iris to keep normal brightness in auto iris mode. Manually operate OPEN or CLIOSE iris adjustment button can also adjust iris. The dome camera will recover auto adjustment function if operate horizontal , vertical rotation or control lens zoom.

2.12 BACKLIGHT COMPENSATION

The object will become black as the shadow if strong light appears in background. Backlight compensation function can compensate the brightness automatically to dark objects in bright light background and adjust the brightness background to avoid the image full of brightness and get clear image. Too strong backlight can make the object illegibility.

3. MENU EXPLANATION

3.1 Operation explanation

This dome camera has in-built menu to set parameters for cameras and lens. The contents in this chapter can make you a complete knowledge of this camera and do some settings according to users' requirements.

The basic operation contains move menu bar, enter next menu, return former menu, change setting, verify change and cancel change.

Control up and down command: move menu bar and change setting

Iris open command: enter camera menu or select menu to verify change

Iris closed command: return former menu and cancel change

3.2 OPEN/EXIT MENU

This dome camera opens menu by preset 95 and exit by preset 94 according to P control protocol. Please refer to controller instruction book for other control equipments.

Press "9"+"5"+"PRESET"

Press key 95+ PRESET to enter dome camera menu

Press "9"+"4"+"PRESET"

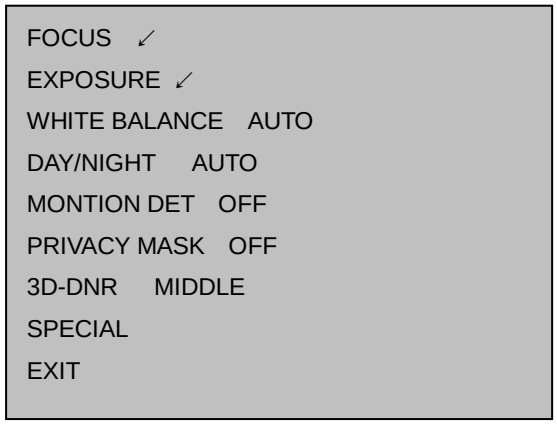
Press key 94+ PRESET to exit dome camera menu

For LG camera,open the dome camera menu,you should do like this:first,save preset 35,then preset 95,after setting the menu preset 94 to close the menu,last preset 35.

4. CAMERA SETTING

only DIS-MD2700/LD2700/MD2700UT/LD2700UT has CAMERA MENU

FOCUS
EXPOSURE
WHITE BALANCE
DAY/NIGHT
MONTION DET
PRIVACY MASK
3D-DNR
SPECIAL
EXIT



Dome camera menu operation (enter, exit and change parameter)

1. Press control up/down to move the cursor to corresponding menu item

2. Press key OPEN of iris to select corresponding menu item and the following parameter will flop.

3. Press control up/down command to edit corresponding values.

4. Press key CLOSE to cancel change and exit.

4.1.1 FOCUS

Focus mode	**4 states: auto/one push/zoom trig/manual**	**default setting is: zoom trig**
Focus dist	**4 modes: 50CM 1M 3M 5M**	**default setting is: 50CM**
Zoom start	**×1 to 26**	**default setting is: ×1**
Zoom end	**value range is: ×2 to ×324**	**default setting is: ×324**
Zoom speed	**3 modes: slow/middle/quick**	**default setting is: quick**
Ztrk mode	**2 states: auto/manual**	**default setting is: auto**
Initial set	**2 states: open/closed**	
exit		

4.1.2 EXPOSURE

Iris	**2 modes:auto manual**	**default setting is: Auto**
AGC	**4 modes:off,low,middle,high**	**default setting is:middle**
WDR/BLC	**4 modes:wdr,blc,hsblc,off**	**default setting is: off**

Brightness **default setting is: 50**

Shutter **X512~X2,AUTO,OFF,A.FLK,1/160~1/90000** **default setting is: Auto**

Sens-up **AUTOX2~AUTOX128** **default setting is: Auto**

If you set to one of the SHUTTER options except AUTO on the SHUTTER memu,the sen-up setting is not available and ---- mark is displayed.

Initial set **2 states: open/closed**

exit

4.1.3 WHITE BALANCE

Color temp **2 modes:indoor,outdoor** **default setting is:indoor**

Red **-100~100**

Blue **-100~100**

SEN-UP **default setting is:off**

Initial set **2 states: open/closed**

exit

4.1.4 DAY/NIGHT

D/N Level **3 modes:low,middle,high** **default setting is:middle**

Dwell Time **5 modes:5,10,15,30,60s** **default setting is:10sec**

Initial set **2 states: open/closed**

exit

4.1.5 MOTION DET

Zone Number **4 zones:1~4** **default setting is:zone 1**

Zone State **2 modes:on,off** **default setting is:off**

Width **default setting is:40**

Height **default setting is:40**

Move X **default setting is:50**

Move Y **default setting is:50**

Sensitivity **default setting is:50**

Motion Zoom **default setting is:off**

Initial Set

Exit **ret**

4.1.6 Privacy Mask

Mask Number **8modes:1~8** **default setting is:mask 1**

Mask State **2 modes:on,off** **default setting is:off**

Mask Color **default setting is:gray**

Width **default setting is:80**

Hight **default setting is:60**

Move X **default setting is:160**

Move Y **default setting is:120**

Reset Mask

Initial Set

Exit

4.1.7 3D-DNR

3D-DNR **3 modes:off,low,middle,high** **default setting is:middle**

4.1.8 Special

Camera ID **255 ID** **default setting is:0**

D-effect **4 modes:v-filp,mirror,rotate,off** **default setting is:off**

Color **2 modes:on,off** **default setting is:on**

Freeze 2modes:on,off default setting is:off
Sharpness default setting is:34
Stabilizer 2 modes:on,off default setting is:off
Osd 2 modes:on,off default setting is:off
Language default setting is:Eng
Initial Set
Exit ret
4.1.9 RESET
Factory Reset
S/W Version
Reboot
Exit

6. DIAL SWITCH SETTING

6.1 DOME CAMERA CONTROL

Note: When one control bus controls several(more than 2)dome cameras, it needs merging a 120ohm resistance at anode& cathode Com 485 in the farthest dome camera in order to ensure the normal work of control signal.

1、Switch setting for SW1

Note: Switch SW1 is used to set protocol, camera and baud rate.

Protocol, camera And baud rate	Switch SW1 setting							
	1	2	3	4	5	6	7	8
Minrray Protocol	OFF	OFF	--	--	--	--	--	--
PELCO-P Protocol	ON	OFF	--	--	--	--	--	--
PELCO-D Protocol	OFF	ON	--	--	--	--	--	--
CNB camera	--	--	OFF	OFF	OFF	OFF	--	--
LG camera	--	--	ON	OFF	OFF	OFF	--	--
MINTRON camera	--	--	OFF	ON	OFF	OFF	--	--
MINRRAY camera	--	--	ON	ON	OFF	OFF	--	--
SANYO camera	--	--	OFF	OFF	ON	OFF	--	--
SONY camera	--	--	ON	OFF	ON	OFF	--	--
HITACHI camera	--	--	OFF	ON	ON	OFF	--	
1200	--	--	--	--	--	--	OFF	OFF
2400	--	--	--	--	--	--	ON	OFF
4800	--	--	--	--	--	--	OFF	ON
9600	--	--	--	--	--	--	ON	ON

2、Switch setting for SW2

Note: Switch SW2 is used to set receiving address.

2. 1 Code P address setting:

Address	Switch setting							
	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7	SW2-8
1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
5	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
6	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
7	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
8	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
9	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
10	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
11	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
12	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
13	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
14	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
15	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
16	ON	ON	ON	ON	OFF	OFF	OFF	OFF
17	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
18	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
19	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
20	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
21	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
22	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
23	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
24	ON	ON	ON	OFF	ON	OFF	OFF	OFF
25	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
26	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
27	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
28	ON	ON	OFF	ON	ON	OFF	OFF	OFF
29	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
30	ON	OFF	ON	ON	ON	OFF	OFF	OFF
31	OFF	ON	ON	ON	ON	OFF	OFF	OFF
32	ON	ON	ON	ON	ON	OFF	OFF	OFF
-----	----	----	----	-----	----	----	----	----
255	OFF	ON	ON	ON	ON	ON	ON	ON
256	ON	ON	ON	ON	ON	ON	ON	ON

2. 2 PELCO- D address setting:

Address	Switch setting							
	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7	SW2-8
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
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
19	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
20	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
21	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
22	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
23	ON	ON	ON	OFF	ON	OFF	OFF	OFF
24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
25	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
26	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
27	ON	ON	OFF	ON	ON	OFF	OFF	OFF
28	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
29	ON	OFF	ON	ON	ON	OFF	OFF	OFF
30	OFF	ON	ON	ON	ON	OFF	OFF	OFF
31	ON	ON	ON	ON	ON	OFF	OFF	OFF
32	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
----	----	----	----	----	----	---	----	----	----
254	OFF	ON	ON	ON	ON	ON	ON	ON
255	ON	ON	ON	ON	ON	ON	ON	ON

Appendix Ⅰ CONTROL PROTOCOL

Ⅰ、P control protocol

1. Command format

BYTE	VALUE	FUNCTION
1	$A0	STX(start transmission)
2	$00 to $FF	Address
3	Data byte 1	
4	Data byte 2	
5	Data byte 3	
6	Data byte 4	
7	$AF	ETX(end transmission)
8	$00-$FF	Check sum (XOR 1-7 bytes)

2. Instruction command

Bit number	7	6	5	4	3	2	1	0
Data 1	0	Camera on	Auto scan on	Camera on/off	Iris Close	Iris Open	Focus Near	Focus far
Data 2	0	Zoom Wide	Zoom Tele	Tile Down	Tile Up	Pan Left	Pan Right	0 (for pan/tilt) 1 (extended
Data 3	Pan speed $00 to $3F and $40 for turbo							
Data 4	Tilt speed $00 to $3F							

3. Special command format

COMMAND	DATA BYTE1	DATA BYTE2	DATA BYTE3	DATA BYTE4
Set Preset .xx	00	03	00	01 to FF
Clear Preset .xx	00	05	00	01 to FF
Go to preset .xx	00	07	00	01 to FF
Flip	00	07	00	21
Zero pan position	00	07	00	22
Set aux. xx	00	09	00	01 to 08

Clear aux. xx	**00**	**0B**	**00**	**01 to 08**
Pattern start	**00**	**1F**	**00**	**00**
Pattern stop	**00**	**21**	**00**	**00**
Run pattern	**00**	**23**	**00**	**00**
Start Sequence prepos	**81**	**81**	**00**	**00**
Insert prepos in stack	**82**	**81**	**00**	**Prepos number**
Delete prepos from stack	**83**	**81**	**00**	**Prepos number**
Clear seq. Stack	**84**	**81**	**00**	**00**
Show seq. Stack	**85**	**81**	**00**	**00**
Sequence dwell time	**86**	**81**	**00**	**(0-255)second**
Home function	**87**	**81**	**Prepos number**	**10X1 sec time-out**
Auto-panning speed	**88**	**81**	**1**	**(0-255)speed**
Auto-panning limit	**88**	**81**	**2**	**1(left)/2(right)**
Auto-panning start	**88**	**81**	**3**	**0**
PT Speed	**89**	**81**	**P speed(0-255)**	**T speed(0-255)**

Example: No.1 address rotator speed:30

Right	**A0**	**00**	**00**	**02**	**30**	**00**	**AF**	**3D**
Left	**A0**	**00**	**00**	**04**	**30**	**00**	**AF**	**3B**
Up	**A0**	**00**	**00**	**08**	**00**	**30**	**AF**	**37**
Down	**A0**	**00**	**00**	**10**	**00**	**30**	**AF**	**2F**
NEAR	**A0**	**00**	**02**	**00**	**00**	**00**	**AF**	**0D**
FAR	**A0**	**00**	**01**	**00**	**00**	**00**	**AF**	**0E**
OPEN	**A0**	**00**	**04**	**00**	**00**	**00**	**AF**	**0B**
CLOSE	**A0**	**00**	**08**	**00**	**00**	**00**	**AF**	**07**

Ⅱ、PELCO D control protocol

1. Command format:

BYTE	VALUE	FUNCTION
1	$FF	STX (start transmission)
2	$01 TO $1F	Address
3	Data byte 1	
4	Data byte 2	
5	Data byte 3	
6	Data byte 4	
7	$00-$FF	Checksum(add byte 2,3,4,5,6)

2. Instruction command:

Bit number	7	6	5	4	3	2	1	0
Data1	0	0	0	0	0	Iris close	Iris open	Focus near
Data2	Focus far	Zoom wide	Zoom tele	Tilt down	Tilt up	Pan left	Pan right	0(for pan/tilt) 1 (extended)
Data3	Pan speed $00 to $40 for turbo							
Data4	Tilt speed $00 to $3F							

3. Special command format:

COMMAND	DATA BYTE1	DATA BYTE2	DATA BYTE3	DATA BYTE4
Set preset. xx	00	03	00	01 to FF
Clear preset. xx	00	05	00	01 to FF
Go to preset. xx	00	07	00	01 to FF
Flip (rotate 180)	00	07	00	21
Zero pan position	00	07	00	22
Set aux. xx	00	09	00	01 to 08
Clear aux. xx	00	0B	00	01 to 08
Pattern start	00	1F	00	00
Pattern stop	00	21	00	00
Run pattern	00	23	00	00

Example:No.1 address

Right	FF	01	00	02	20	00	23
Left	FF	01	00	04	23	00	28
Up	FF	01	00	08	00	23	2C
Down	FF	01	00	10	00	23	34
OPEN	FF	01	02	00	00	00	03
CLOSE	FF	01	04	00	00	00	05
NEAR	FF	01	01	00	00	00	02
FAR	FF	01	00	80	00	00	81

Appendix Ⅱ TROUBLESHOOTING

1. Image

Ask: No image displayed monitor?

→First check if the power supply wire connection, voltage, indicator and dome camera work well, and then check the video wires, or it may be the drive trouble.

Ask: Image becomes black after self check, but can be controlled

→Disturb of control system changes the camera iris parameters. Enter the camera menu then reset camera.

Ask: Image becomes fog when dome camera connects with hard disk video recorder.

→Maybe it is related with the compressed card of hard disk video recorder.

Ask: abnormal display of image

→Check the video connecting wires is well and other connecting sockets and camera flat wires are well.

Ask: Iris is small with many snowflakes after connection

→The camera parameter changed. Please enter the menu to reset the camera.

Ask: The camera can only works at one focus, other position can not be focused.

→Change the position to see if this phenomenon still exists. If yes, it may be caused by camera control drive focus control system trouble.

Ask: image cannot be clearly seen even at MAX. Zoom

→Maybe electronic zoon open or the observed object is too close to imaging.

Ask: the image is reddish or greenish. Does the WB parameter change?

→The camera parameter changed. Enter the menu to reset the camera.

Ask: the color-to black& white camera can not change to black& white or cannot return to color

→Check if the pharosage is too high or too low. Rotate control to other angle to see if normal. If no, reset camera parameter.

Ask: the image wobbles at MAX. Zoom

→It is related to the firm of installation position if there are quaky machines or objects.

2. Control

Ask: the single dome camera cannot be controlled by keyboard or other control equipments?

→First check if control line 485 is well connected to designed position with right direction. Then check the control equipment and dome control protocol, baud rate and address. If it still can not be controlled, use elimination to check whether the control equipments or camera has troubles.

Ask: single camera can be controlled but multi-cameras cannot be controlled

→It may be caused by reflection of signal 485. Merge a 120 ohm resistance to the 485 anode and cathode control wires of the farthest camera.

Ask: other controls are normal except it can not rotate at a direction.

→First check if any mechanical troubles without electrifying. If it can run well, check if the belt broke or loose. If yes, it is caused by the control decode board troubles.

Ask: the camera automatically rotates after electrifying.

→First check if the electrifying mode is auto scan mode; if not, firstly cut 485 control lines to see if it happens. If stopping, it may be caused by the scrambled code from controller or disturb to 485 lines.

Ask: the provided keyboard software can control, but the DVR cannot control or only can control some?

→DVR control protocol is not agreed with our company or the function is not completed.

Ask: why does the same dome have different control speeds at different hard disk video recorder?

→Speed command codes in control software of DVR are different.

Ask: DVR cannot control speed of camera

→Control command code of control software in DVR only has a fixed speed.

Ask: the camera rotates disorderly. The image is blackish or whitish.

→There are disturbs to 485 lines, check the equipments in the lines such as optical transmitter and receiver.

Ask: the dome camera can be controlled normally in the morning and evening, but it cannot be controlled at the noon of summer.

→High temperature may cause lower down of control line anti-jamming or change to control equipment and CMOS chips parameters to make troubles. Check if the temperature is over than the specified limit and the radiator fan.

Ask: camera continuously does self-check up after electrifying

→The supply voltage is too low or the power is not enough. Our matching transformer or above 2.5A AC24V transformer are recommended. The installation distance is better no more than 30m with 1 sq. mm diameter.

3. Installation

Ask: what kind of power supply is needed?

→AC 24V, 2.5A above power transformer is recommended.

Ask: what is the MAX. Distance of AC 24V power wire and what requirements does it have to wire materials?

→Normally, the power wires have some resistance. There is some loss during voltage transmission. The longer the wire is and the smaller the wire diameter is, the worse loss will be. Please refer to following wire diameter and distance requirement in order to avoiding the abnormal work caused by insufficient voltage.

Power wires diameter	0.5mm^2(20#)	1.0 mm^2(18#)	1.5 mm^2(16#)	2.5 mm^2(14#)
Dome camera distance	11m(37 ft)	18m(60 ft)	29m(95 ft)	46m(152 ft)

For example: the distance to power supply from the dome camera is 35mm. it must take 2.5 mm^2 above section copper-core power wires or it may cause insufficient power supply leading to abnormal work

Ask: what is the MAX. Distance of video wire and what requirements does it have to wire materials?

→The video wire also has inner loss as the power wire. The more the wire is and the small the specification is, the worse loss it will be. The high the signal frequency is, the obvious the loss is. The normal video wires models and the MAX. Transmission distance is listed in following table:

Video wire model	Max. distance		Video wire model	Max. distance
75-2	About 150m		75-5	About 370m
75-3	About 200m		75-7	About 500m
75-4	About 270m		75-9	About 680m

Ask: what wire and transmission distance should RS 485 control line take?

→Transmission distance of RS 485 is related to wire diameter and transmission speed. Max. transmission distance for RS 485 is 1200M according to the specified 9600b/s transmission speed for 1.0mm2 UTP.

Remarks: the same model wires may be different for produced by different manufacturers. Above data is the normal wire transmission reference distance.