

# **IR Intelligent Speed Dome User's Manual**

# Table of Contents

<b>1</b>	<b>FEATURES AND FUNCTIONS .....</b>	<b>1</b>
1.1	General Introduction.....	1
1.2	Features.....	1
1.2.1	On-Screen Menu.....	1
1.2.2	On-screen Tips.....	1
1.2.3	Support multiple protocols.....	1
1.2.4	Proportional Pan and Tilt.....	1
1.2.5	Preset Setup and Recall.....	1
1.2.6	Auto Scan.....	1
1.2.7	Auto Touring.....	2
1.2.8	Auto Pattern.....	2
1.2.9	Privacy Masking.....	2
1.2.10	IR Night Vision.....	2
1.2.11	Auto Flip.....	2
1.2.12	Self-diagnosis.....	2
1.2.13	Day/Night Mode (B/W & Color Mode).....	2
1.2.14	Auto Focus.....	2
1.2.15	Backlight Compensation.....	2
1.2.16	Pan Tilt and Zoom.....	2
1.2.17	3D Intelligent Location.....	3
1.2.18	Idle Status.....	3
1.2.19	Power up.....	3
1.2.20	Image Flip.....	3
<b>2</b>	<b>PROTOCOL, BAUD RATE, ADDRESS SETUP .....</b>	<b>4</b>
2.1	Protocol and Baud Rate Setup.....	4
2.2	Set address dial switch.....	5
<b>3</b>	<b>CABLE CONNECTION .....</b>	<b>7</b>
3.1	Power Board Cable Connection.....	7

<b>3.2</b>	<b>System Layout .....</b>	<b>7</b>
3.2.1	BUS connection .....	7
3.2.2	Star Connection .....	8
<b>3.3</b>	<b>Keyboard Connection .....</b>	<b>8</b>
<b>4</b>	<b>MENU .....</b>	<b>10</b>
<b>4.1</b>	<b>Screen Menu Index .....</b>	<b>10</b>
<b>4.2</b>	<b>Self-diagnosis System Information .....</b>	<b>11</b>
<b>4.3</b>	<b>Main Menu .....</b>	<b>11</b>
<b>4.4</b>	<b>Menu Operation .....</b>	<b>12</b>
4.4.1	System Information.....	12
4.4.2	Display Setting .....	13
4.4.3	Camera Setting .....	13
4.4.4	Function Setting .....	17
4.4.5	IR Light Setup.....	23
<b>4.5</b>	<b>Dome Abnormal Phenomenon Operation.....</b>	<b>24</b>
4.5.1	Restore to Factory Default Setup .....	24
4.5.2	PTZ Movement is not smooth .....	24
<b>5</b>	<b>FAQ.....</b>	<b>25</b>
<b>5.1</b>	<b>Daily Maintenance .....</b>	<b>25</b>
<b>5.2</b>	<b>Problems and Solutions .....</b>	<b>25</b>
<b>6</b>	<b>APPENDIX I THUNDER PROOF AND SURGE PROTECTION .....</b>	<b>26</b>
<b>7</b>	<b>APPENDIX II ABOUT RS485 BUS .....</b>	<b>27</b>
<b>7.1</b>	<b>RS485 Bus Main Feature .....</b>	<b>27</b>
<b>7.2</b>	<b>RS485 Bus Transmission Distance .....</b>	<b>27</b>

7.3 Connection Methods and Terminal Resistance ..... 27

7.4 The Problem in Practical Use ..... 27

7.5 RS485 Bus FAQ ..... 28

8 APPENDIX TOXIC OR HAZARDOUS MATERIALS OR ELEMENTS ..... 29

## **Welcome**

Thank you for purchasing our product!

This user's manual is designed to be a reference tool for the operation of your system.

Here you can find information about this speed dome features and functions, as well as a detailed menu tree.

Please keep it well for future reference!

**Before installation and operation, please read the following safeguards and warnings carefully!**

# Important Safeguards and Warnings

## 1 . Electrical safety

- All installation and operation here should conform to your local electrical safety codes.
- We assume no liability or responsibility for all the fires or electrical shock caused by improper handling or installation.
- We are not liable for any problems caused by unauthorized modification or attempted repair.

## 2 . Transportation Security

- No heavy stress, violent vibration or water splash are allowed during transportation, storage and installation.
- Please use the original packing material (or the material of the same quality) when you ship it back to the manufacturer.

## 3 . Installation

- Do not apply power to the product before completing installation.
- Do not put object on the product.

## 4 . Environment

- This series product should be installed in a cool, dry place away from direct sunlight, inflammable, explosive substances and etc.
- Always use the product under the specified working environment. Please keep it away from the electromagnetic radiation object and environment.
- Please keep the sound ventilation.
- Do not allow the water and other liquid falling into the device.
- Please make sure the CCD (CMOS) component is out of the radiation of the laser beam device. Otherwise it may result in CCD (CMOS) optical component damage.

## 5. Daily Maintenance

- Current series product has no power button. Please unplug all corresponding power cables before your begin installation or daily maintenance work.
- Please keep the dustproof cap back to protect the CCD or CMOS part if the device does not work for a long time.
- Do not touch CCD (CMOS) component. You can use the blower to clean the dust on the surface of the device. You can use the dry cloth with some alcohol or mild detergent to clear if necessary.
- Do not use the volatility solvent such as the benzene or thinner, or detergent with strong abrasibility. It may result in lens damage or it may adversely affect the device performance.
- If there is too much dust, please use the water to dilute the mild detergent first and then use it to clean the device. Finally use the dry cloth to clean the device

## **6. About Accessories**

Always use all the accessories recommended by manufacturer.

Before installation, please open the package and check that all the components are included in the package:

Contact you local retailer ASAP if something is missing in your package.

# 1 Features and Functions

## 1.1 General Introduction

This series IR intelligent speed dome product is an integrated high intelligent speed dome. It adopts waterproof design and has small and delicate shape. This is a digital and intelligent product of vivid video. It supports the auto IR light enable function in low illumination environments and the near and far light intelligent control. The installation is convenient.

The IR intelligent speed dome external ports adopt the buckle device to realize the quick installation. There is waterproof interface for the pipe thread. All of these make the installation easier. It supports various languages, and protocol auto recognition. It supports 360° continuously pan, 92° tilt and 180° auto flip. It can realize no blind spot monitor.

This series product can be widely used in remote monitor environments such as electric power, customs, and water conservancy. It is suitable for the monitor environments of low illuminations such as the village, town and suburb.

## 1.2 Features

This series speed dome has the following features:

### 1.2.1 On-Screen Menu

This series product menu supports multiple languages display and switch.

It is easy for you to view dome information and configure dome, camera parameters.

### 1.2.2 On-screen Tips

It is the screen operation prompt. Here you can set call preset and display the preset number during the tour. It can display preset title, system software version, speed dome position coordinates and etc.

### 1.2.3 Support multiple protocols

This series speed dome supports universally used protocols such as PELCO-P and PELCO-D. You can use various devices (such as matrix, control keyboard and DVR) and protocols to operate speed dome.)

### 1.2.4 Proportional Pan and Tilt

This function keeps the image from moving too fast when there is a large amount of zoom.

Speed dome continually decreases or increases pan and tilt speeds in proportion to depth of zoom. When zooms speed is increasing, the camera moving speed becomes slow. When zooms speed is decreasing, the camera moving speed becomes fast.

### 1.2.5 Preset Setup and Recall

Preset function is to save the address information (such as PTZ pan/tilt, focus and etc) to the memory so that you can quickly adjust the dome and PTZ to the correct position. This series speed dome max supports 255 presets in PELCOD and PELCOP protocols. .

### 1.2.6 Auto Scan

Camera scans back and forth regularly in a horizontal field. Here you need to set left and right limit and scan speed. You can set 5 scanning paths.

### **1.2.7 Auto Touring**

Add addresses into a routine in a desired order and then set time and stop duration for each address. The dome will begin an auto touring between these addresses. There are max 32 presets in one touring.

### **1.2.8 Auto Pattern**

Memorize dome operation such as pan, tilt, and zoom to repeat. You can call it to repeat the previous operation.

### **1.2.9 Privacy Masking**

Privacy masking is a user-defined, four-sided area that can not be viewed by you. The masking area will move with pan and tilt functions and automatically adjust in size as the lens zooms. You can set 8 privacy masking zones (Depends on camera type).

### **1.2.10 IR Night Vision**

In the night vision status, it can use the IR light to spot the monitor object, or you can monitor the environments in the low illumination at night.

### **1.2.11 Auto Flip**

As long as you continue to hold the keyboard joystick in the down position, the dome rotates 180 degrees and repositions itself for uninterrupted viewing of any subjects that passes directly beneath the dome.

### **1.2.12 Self-diagnosis**

There is a self diagnosis procedure when dome boots up.

- Tilt and vertical engine check
- Camera diagnostics
- Display dome information and diagnosis information such as address, protocol, baud rate, type.

### **1.2.13 Day/Night Mode (B/W & Color Mode)**

System supports auto/manual switch in low illumination. You can specify the switch time.

- In the auto mode and photosensitive resistance mode, the camera can automatically switch the CCD level according to the light change. In the manual mode, it can use the menu or the button to realize the color display, black and white display, and schedule switch. All the modes will have automatically activation operation on the IR light except the camera auto mode.
- This function works with the IR night vision function.

### **1.2.14 Auto Focus**

Auto focus allows the lens to remain in focus during zoom-in, zoom-out and motion functions to get vivid image. You can use FAR or NEAR button to adjust focus manually.

### **1.2.15 Backlight Compensation**

Balance the brightest and darkest sections of a scene to produce a more vivid picture.

### **1.2.16 Pan Tilt and Zoom**

Supports zoom in and zoom out during tilt and pan movement.  
In this period focus and iris are both in auto mode to get vivid image.

### **1.2.17 3D Intelligent Location**

Working with DVR, just click part of the current scene will be displayed in the central window and automatically zooms. All of these allow you to trace precisely.

### **1.2.18 Idle Status**

When there is no available order, you can use menu to set dome idle status after specified duration. The idle status includes turn to specified preset or go to scan, tour or pattern function.

### **1.2.19 Power up**

The speed dome executes the power up operation after it rebooted and completed the initialization. The power up function includes auto, preset, scan, tour, pattern and none.

### **1.2.20 Image Flip**

You can enable image flip in the menu.

The flip function allows you to view continuous video.

## 2 Protocol, Baud Rate, Address setup

Before you operate, you need to set protocol, baud rate and address. Otherwise you can not control the product!

### 2.1 Protocol and Baud Rate Setup

Please configure the following settings before begin controlling dome:

- Address
- Baud rate
- Parity

**Note: Please reboot the speed dome to get all the setups activated!**

Open the lower dome, the interface is shown as below. See Figure 2-1.

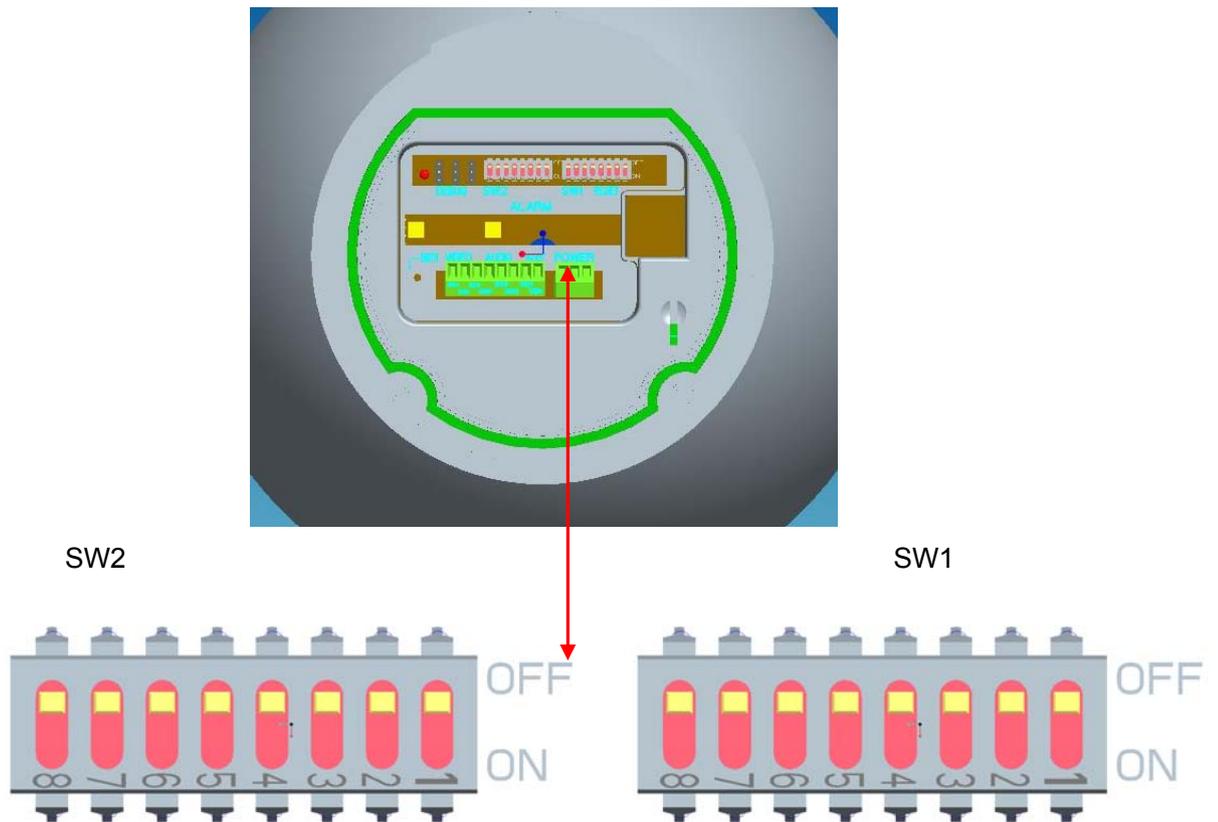


Figure 2-1

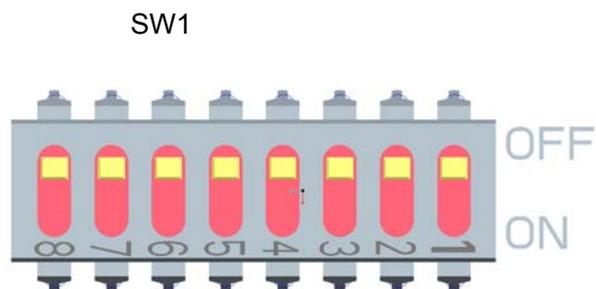


Figure 2-2

Please refer to the protocol sheets for detailed information.

Reserved			Baud rate		Parity		120Ω	Connect to the 120Ω
1	2	3	4	5	6	7	8	ON

**Please note the speed dome cans automatically recognize the industrial protocol, PELCO-D. PELCO-P. Usually you do not need to set.**

Please refer to the baud rate sheet for detailed information.

4	5	Baud Rate
OFF	OFF	9600bps
ON	OFF	4800bps
OFF	ON	2400bps
ON	ON	1200bps

Please refer to the parity setup sheet for detailed information.

6	7	Parity
OFF	OFF	NONE
ON	OFF	EVEN
OFF	ON	ODD
ON	ON	NONE

## 2.2 Set address dial switch

SW2

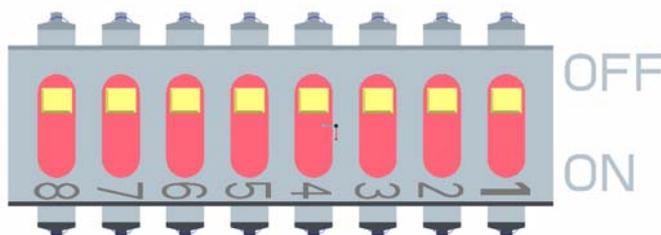


Figure 2-3

The encode mode adopts binary system. 1 to 8 is the valid bit. The highest address bit is 255. You can refer to the following sheet for more information.

**Note:**

The broadcast address is 255. When the host device address is 255, you can control all the intelligent speed domes connected to the host so that you can debug conveniently.

Address	1	2	3	4	5	6	7	8
1	OFF							
1	ON	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						
255	ON	ON	ON	ON	ON	ON	ON	ON

### 3 Cable Connection

#### 3.1 Power Board Cable Connection

The speed dome combination cable includes video cable, RS485 control cable, and power cable. It is to transmit analog video signal, control signal, power connection and etc. Please refer to the label for detailed information.

##### RS485 and video port

Name		Function
485	A	485-A. It is to control dome built-in PTZ.
	B	485-B. It is to control dome built-in PTZ.
	GND	Ground.
AUDIO	OUT	Reserved audio port. Audio output port. <b>Right now the device does not support this function.</b>
	GND	Reserved audio port. Ground port audio. <b>Right now the device does not support this function.</b>
	IN	Reserved audio port. Audio connection port. <b>Right now the device does not support this function.</b>
VIDEO	GND	Ground port.
	OUT	Video output port.

##### Power port

Name	Function
POWER	Power port. Connect to the power cable.
EARTH	Ground port.

### 3.2 System Layout

#### 3.2.1 BUS connection

Please refer to Figure 3-1 and Figure 3-2 for BUS cable connection.

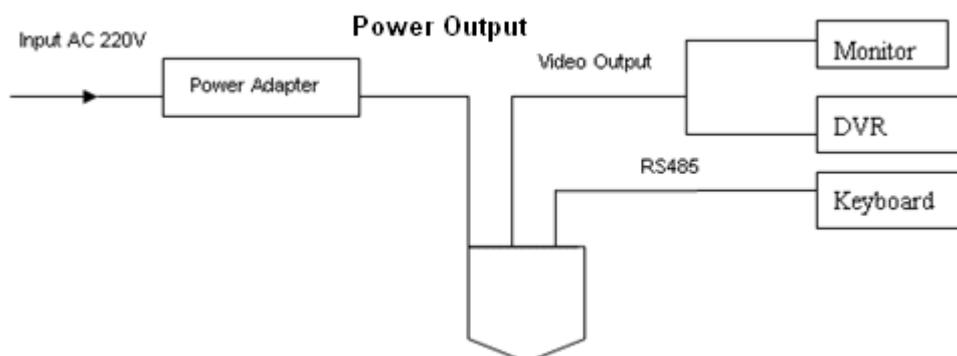


Figure 3-1

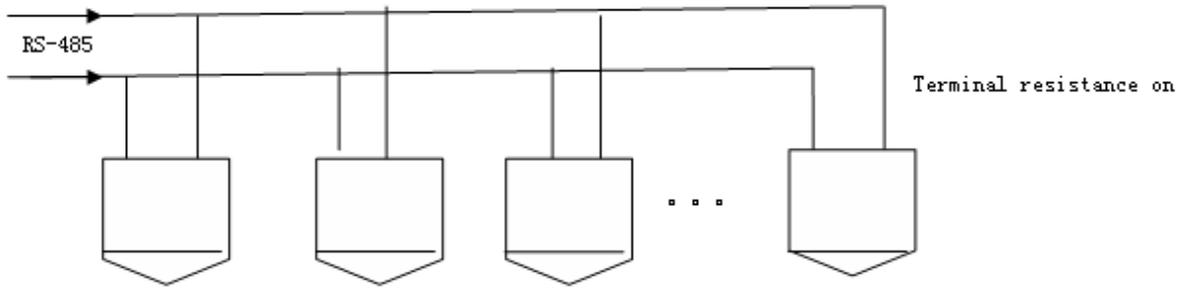


Figure 3-2

**Note:**

Please use shielded twisted pair. The shielded layer shall connect to GND firmly; otherwise it may affect communication or video work.

**3.2.2 Star Connection**

Please refer to Figure 3-3 for star connection information.

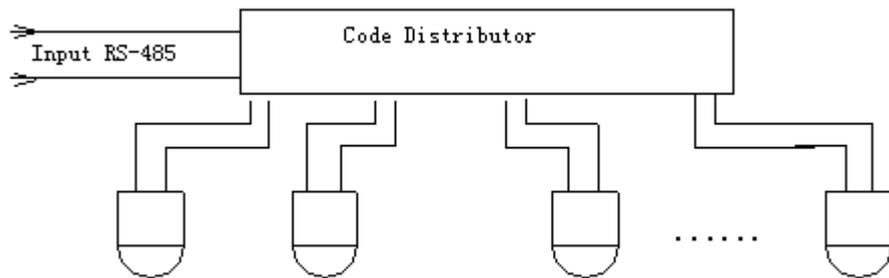


Figure 3-3

**3.3 Keyboard Connection**

This series dome supports keyboard operation. You can use keyboard to control the dome and PTZ. The display and control can work simultaneously. One keyboard can control maximum 255 speed domes.

Please refer to Figure 3-4.

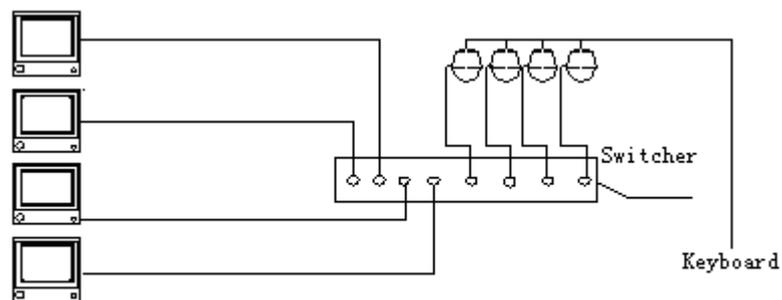


Figure 3-4

This IR intelligent speed dome protocol is open and supports multiple popular system platforms in today's

market. Please contact us freely if some matrix systems do not support dome camera communication protocol. The most direct and easy way is to use current system to process video signal and add some control keyboards to control speed dome. See Figure 3-5.

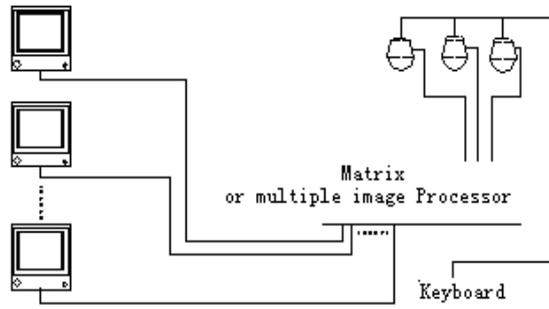


Figure 3-5

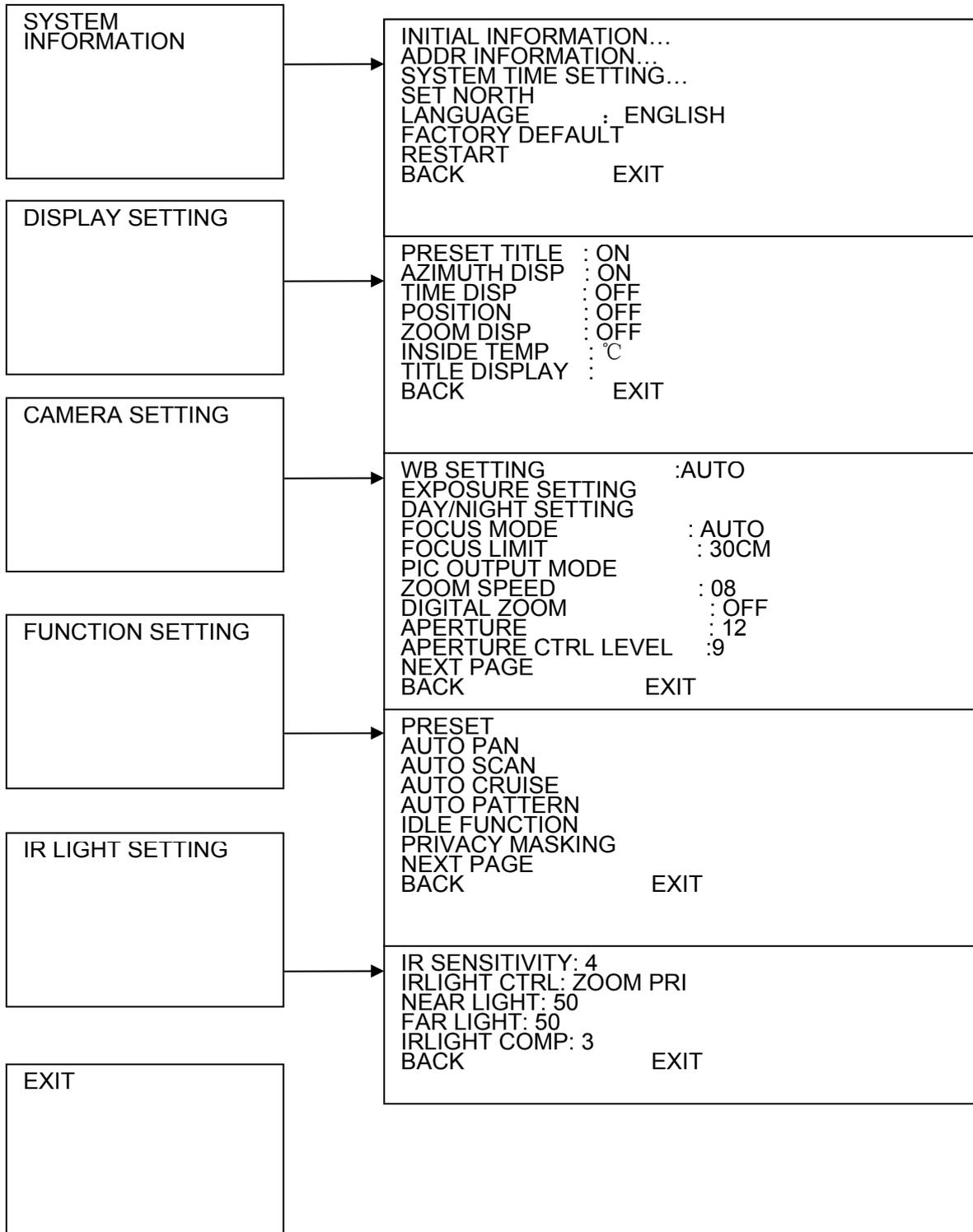
# 4 Menu

## 4.1 Screen Menu Index

**Note:**

ERR means current setup is invalid. Please restore factory default setup.

Slight difference may be found in the parameter interface due to different product series. .



The above diagram illustrates the overall structure of the speed dome setup menu.

**Note:**

- ERR means current setup is invalid.
- Please make sure all the cable connections are right.

## 4.2 Self-diagnosis System Information

```
ADDR      : 001-H
BAUD RATE : 9600
PARITY    : NONE
SOFTWARE  : V1.00.0R

END
```

After installation, please connect speed dome to power. The system goes on a self-diagnosis, and then it pops up the above interface to show the system information.

If there is anything wrong during the self-diagnosis, system pops up error code.

The above interface disappears after speed dome received the first command (or the display time lasts for 40 seconds.)

- ADDR: Here you can view dome address information. For example, 001-H, 1 is the address number, -H is hard address mode. -S is software address mode.
- Baud rate: Dome communication baud rate.
- Parity: Communication parity bit format.
- Software: Dome PTZ software version.

**When you are using the control keyboard or the matrix host to control the device, please make sure the control parameter of the keyboard or the matrix host is the same with the speed dome OSD (including address, baud rate, parity). Please make sure the cable connection is OK.**

## 4.3 Main Menu

You can open the IP dome menu via control keyboard, matrix, or speed dome control terminal.

```
SYSTEM INFORMATION
DISPLAY SETTING
CAMERA SETTING
FUNCTION SETTING
IR LIGHT SETTING
EXIT
```

- SYSTEM INFORMATION: Dome self-diagnosis information, address information, set north direction, language, factory default setup, reboot and so on.
- DISPLAY INFORMATION: Display dome preset title, azimuth display, direction, zoom, dome internal temperature and etc.
- CAMERA PARAMETERS : Set camera white balance setup, camera exposure setup, day/night setup, focus setup, focus limit, zoom speed, digital zoom, aperture setup. The next page includes flip, freeze, focus sensitivity, stabilization, factory default, reboot and etc.
- FUNCTION SETTING : Set preset, pan, auto scan, auto cruise, auto pattern, idle function and privacy mask function. The next page includes PTZ speed, initialization position setup, power up, menu idle time, PTZ auto stop setup, heater setting and etc.
- IR LIGHT SETTING: Set dome IR sensitivity, IR light control principle, medium and far light bright, far light

bright, IR light compensation and etc.

- EXIT : Log out the system menu.

## 4.4 Menu Operation

In the speed dome main menu, you can use the left/right button on the keyboard or in the speed dome terminal menu to configure the system menu. Before setup, please move the cursor to the current item you want to configure.

- In main menu, please click confirm button to go to the sub menu or use left/right key to configure setup.
- Use up/down button to select back option and then click confirm button to go back to the previous menu.
- Use up/down button to select exit option and then click confirm button to log out system menu.
- All setup here will not lose when encounter power failure.

### 4.4.1 System Information

```
INITIAL INFORMATION
ADDR INFORMATION
SET NORTH
LANGUAGE           : ENGLISH
FACTORY DEFAULT
RESTART
BACK
EXIT
```

- INITIAL INFORMATION: Move the cursor to INITIAL INFORMATION and then click confirm button to go to the third submenu.
- ADDR INFORMATION: Move the cursor to SITE INFORMATION and then click confirm button to go to the third submenu.
- SET NORTH DIRECTION: Set dome benchmark direction so that you can know the angel between the benchmark and then current location. Please move the cursor to the option and then click confirm button until you see O.K. Now you have set north direction.
- LANGUAGE: The dome menu language. There are several languages for you to select. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- FACTORY DEFAULT: Restore dome factory default setup. Please move the cursor to the option and then click confirm button until you see O.K. Now you can see the IP dome begin rebooting to restore factory default setup.
- RESTART: Reboot the speed dome.
- BACK: Go back to the previous menu.
- EXIT: Log out system menu.

#### 4.4.1.1 Initialization information

```
ADDR           : 001-H
BAUD RATE      : 9600
PARITY         : NONE
SOFTWARE       : V1.00.0.RHAGAD
BACK
EXIT
```

Move the cursor to INITIAL INFORMATION and then click confirm button, you can see the above interface. Here you can view dome basic information.

#### 4.4.1.2 Address Information

ADDR TYPE	: HARD
ADDR-HARD	: 001
ADDR-SOFT	: 001
BACK	
EXIT	

Move the cursor to SITE INFORMATION and then click confirm button.

- ADDR TYPE: There are two options: soft and hard. Please use the left/right button on the keyboard or in the speed dome terminal menu to set. **Please note you need to reboot to activate current setup.**
- ADDR-HARD: It is an address you set in the dial switch. You can not modify it through software.
- ADDR-SOFT: You can set address via software. It is to say, you can use menu to modify dome address. The value ranges from 0 to 255. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- BACK: Go back to the previous menu.
- EXIT: Log out system menu.

#### 4.4.2 Display Setting

PRESET TITLE	: ON (ON/OFF)
AZIMUTH DISP	: ON (ON/OFF)
POSITION	: OFF (ON/OFF)
ZOOM DISP	: OFF (ON/OFF)
INSIDE TEMP	: OFF (°C/OFF)
TITLE DISP	: OFF (ON/OFF)
BACK	
EXIT	

Move the cursor to DISPLAY SETUP and then click confirm button, you can go to the third submenu. Please use the left/right button on the keyboard or in the speed dome terminal menu to set. After completed setup, please click save button to save current setup.

- PRESET TITLE: Display dome preset title or not. Please use the left/right button on the keyboard or in the speed dome terminal menu to set. You can go to Function Setup->Preset section to set corresponding preset value and preset title.
- AZIMUTH DISP: Display dome current coordinates or not. Please use the left/right button on the keyboard or in the speed dome terminal menu to set
- POSITION: Display the angel between the benchmark and then current location. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- ZOOM DISP: Display speed dome zoom speed or not. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- INSIDE TEMPERATURE: Display dome internal temperature or not. There are three options: °C/F/Off. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- TITLE DISPLAY: Here you can set to display the speed dome title or not.
- BACK: Go back to the previous menu.
- EXIT: Log out system menu.

#### 4.4.3 Camera Setting

Please note slight different may be found due to different series.

```

WB SETTING
EXPOSURE SETTING
DAY/NIGHT SETTING
FOCUS MODE           :AUTO
FOCUS LIMIT          : 30CM
PIC OUTPUT MODE
ZOOM SPEED           : 08
DIGITAL ZOOM         : OFF
APERTURE             : 09
APERTURE CTRL LEVEL: 9
NEXT PAGE
BACK
EXIT

```

Move the cursor to CAMERA SETTING and then click confirm button, you can go to the submenu.

- WHITE BALANCE SETUP: It is to set the camera white balance mode. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- EXPOSURE SETTING: It is to set the camera exposure mode, gain and etc. Move the cursor to current option and then click confirm button, you can go to the third menu.
- DAY/NIGHT: Set day/night mode. There are four options: IR auto/black and white/color/auto. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- FOCUS MODE: There are two modes: Manual/Auto. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- FOCUS LIMIT: It is to set the distance between the camera and the object. It can prevent the focus distance is too small which may result in focusing on the enclosure. At the same time, you can change the distance to change the focus speed.
- PICTURE OUTPUT MODE: It is to set picture hue, saturation, gamma and etc. Move the cursor to current option and then click confirm button, you can go to the third menu.
- ZOOM SPEED: It is to set zoom speed. The bigger the value is, the faster the speed is. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- DIGITAL ZOOM: There are two options: on/off. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- APERTURE: It is to adjust the lens to achieve clear video. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- APERTURE CTRL LEVEL: System can auto reduce the aperture to lower the video noise when it is in low illumination environment. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- NEXT PAGE: It includes the following options: picture flip, freeze function, focus sensitivity, stabilization, camera factory default setup, camera restart. Please use the left/right button on the keyboard or in the speed dome terminal menu to set. Click the OK button; you can view the rest camera settings.
- BACK: Go back to previous menu.
- EXIT: Log out system menu.

#### 4.4.3.1 White Balance Setup

```

WB MODE : AUTO

```

Move the cursor to WHITE BALANCE MODE and then click confirm button, you can go to the submenu.

- WHITE BALANCE MODE: Set white balance adjustment mode. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.

#### 4.4.3.2 Exposure Setting

AE MODE	: AUTO
GAIN SETTING	: 02
SHUTTER	: 1/50
IRIS SETTING	: 11
EXPOSURE COM	: 08
SLOW AE	: 01
SLOW SHUTTER	ON
WDR ENBALE	: OFF
NEXT PAGE	
BACK	
EXIT	

BLC	: ON/OFF
GAIN LIMIT	: 08
SLOW SHUTTER LIMIT	: 1/12
NOISE REDUCTION	: 03
3D NOISE CONTROL	: ON/OFF
BACK	
EXIT	

- AE MODE: Here you can set the camera exposure mode. It includes: auto/manual/AV (iris priority)/TV (shutter priority). Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
  - Auto: It becomes valid after you set the exposure compensation, backlight compensation (BLC), slow shutter, wide dynamic region (WDR).
  - Manual: It becomes valid after you set the gain setting, shutter, iris setting, wide dynamic region (WDR).
  - AV: It becomes valid after you set the exposure setting, iris setting, wide dynamic region (WDR).
  - TV: It becomes valid after you set the shutter setting, exposure compensation, wide dynamic region (WDR).
- GAIN SETTING: It is to set camera gain. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- SHUTTER: You can set shutter speed here. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- IRIS SETTING: It is to set camera iris. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- EXPOSURE COM: It is to set camera exposure compensation. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- SLOW AE: In the strong light environment, you can lower the camera exposure speed to capture the image and enhance the definition. There are several options for you. The bigger the value is, the slow the exposure speed is and the time is long. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- SLOW SHUTTER: In lower illumination environment, you can lower the cameras auto exposure time to capture the image and enhance the definition. **Please note for the moving object, the image trail phenomenon may occur.** Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- WDR ENBALE: It is an abbreviation for wide dynamic region. Please make sure your camera supports current function. This function can adjust the video brightness when the contrast between the strong light and the dark light is too high. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- NEXT PAGE: It includes: BLC, GAIN LIMIT, SLOW SHUTTER LOW LIMIT, NOISE REDUCTION, 3D NOISE REDUCTION. Move the cursor to the item and then click the left/right button to set.
  - BLC: It is an abbreviation for back light compensation. System can compensate the object in the dark light to achieve a clear video. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
  - GAIN LIMIT: It is to control the camera gain. The video noise may be too high if the gain value is large in the low illumination.

- SLOW SHUTTER LOW LIMIT: It is to set the camera slow shutter. If the shutter time is too long, it may affect the video real-time feature.
- NOISE REDUCTION: There may be noise when the camera is monitoring the low illumination environments. You can use the digital filter to process the noise to guarantee the clear video.
- 3D NOISE REDUCTION: System can reduce the noise according to the previous frames and current frame. It has the sound noise reduction function but it may affect the video real-time feature.
- BACK: Go back to previous menu.
- EXIT: Log out system menu.

#### 4.4.3.3 Day/Night Setting

Move the cursor to DAY/NIGHT SETTING and then click confirm button, you can go to the submenu.

DAY/NIGHT	: AUTO
SENSITIVITY	:4
SAVE	
BACK	
EXIT	

- DAY/NIGHT: It is to set day/night mode. There are several options. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- SENSITIVITY: It is the threshold value when the system switches from the black and white to the color in the auto mode.
- BACK: Go back to previous menu.
- EXIT: Log out system menu.

#### 4.4.3.4 Next Page

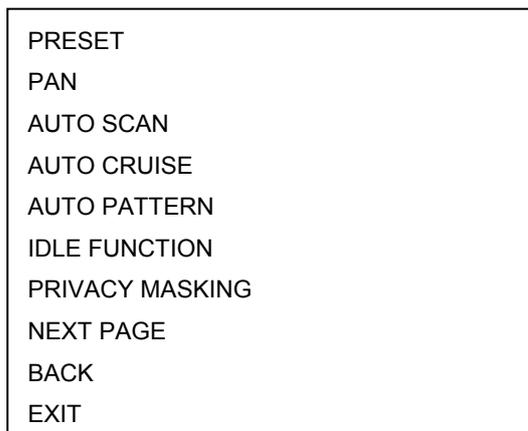
Move the cursor to NEXT PAGE and then click confirm button, you can go to the submenu.

PICTURE FLIP	: ON
FREEZE FUNCTION	: ON
FOCUS SENSITIVITY	: DEFAULT
STABILIZATION	: ON
PIC MODE	: 1080P/25
CAMERA FACTORY DEFAULT	
CAMERA RESTATRT	
BACK	
EXIT	

- PICTURE FLIP: It is to flip the image. There are two options: on/off. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- FREEZE FUNCTION: This function allows the system from one preset to another preset, without showing the video during the PTZ movement. There are two options: on/off. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- FOCUS SENSITIVITY: It is the auto focus sensitivity.
- STABILIZATION: It is to remove the risk of the video vibration resulting from the speed dome movement.
- PICTURE MODE: It is to set camera output resolution and frame rate.
- CAMERA FACTORY DEFAULT SETTING: Move the cursor to current item and then click confirm button to restore factory default setup.
- CAMERE RESTART: Move the cursor to current item and then click confirm button to reboot the camera.

- BACK: Go back to previous menu.
- EXIT: Log out system menu.

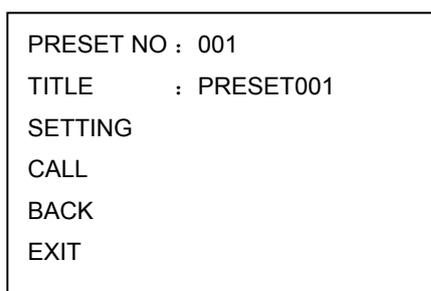
#### 4.4.4 Function Setting



Please go back to main menu and move the cursor to FUNCTION SETTING, click confirm button. You can see the above interface.

- PRESET: Move the cursor to PRESET and then click confirm button to go to the third submenu.
- PAN: It is to set the speed dome rotation speed. Move the cursor to PAN and then click confirm button to go to the third submenu.
- AUTO SCAN: It is to set the speed dome scan number and scan speed. Move the cursor to SCAN and then click confirm button to go to the third submenu.
- AUTO CRUISE: It is to set the cruise (tour) number and task. Move the cursor to AUTO CRUISE and then click confirm button to go to the third submenu.
- AUTO PATTERN: It is to set the pattern number and etc. Move the cursor to PATTERN and then click confirm button to go to the third submenu.
- IDLE FUNCTION: It is to set the idle movement and idle time. Move the cursor to IDLE FUNCTION and then click confirm button to go to the third submenu.
- PRIVACY MASKING: Move the cursor to PRIVACY MASKING and then click confirm button to go to the third submenu.
- NEXT PAGE: It includes PTZ speed, set zero, power up, menu idle, PTZ auto stop, and heater. Move the cursor to the item and then click the confirm button to set. .Click the confirm button to view rest setting items.
- BACK: Go back to previous menu.
- EXIT: Log out system menu.

##### 4.4.4.1 Preset Setup



Move the cursor to PRESET button and then click confirm button to go to set interface.

- PRESET NO: Please use left/right key to modify preset number. The value ranges from 1 to 255.

- TITLE : Title text is the label used for you to identify the camera. System will automatically name a title for the camera.
- SETTING: Please input preset number first and then select the monitor zone. Please move the cursor to setting and click confirm button. The system will pop up a message: PRESET: \*\*\*. Here \*\*\* means preset number. And the SETTING column pops up an OK. Now you successfully added a preset. Please note, you need to enable display preset title function first (Main menu->display setting->preset title). Repeat the above procedures to set more presets. Once you want to modify a preset, you can input the preset number you want to modify and then follow the above steps to set the preset. You can successfully modify a preset content.
- CALL: Here is to recall preset. Move the cursor to PRESET NO and then input corresponding preset value. Then move the cursor to CALL and then click confirm button to go to a preset.
- BACK: Go back to previous menu.
- EXIT: Log out system menu.

**For PELCO protocol user, please refer to the following special functions:**

- **Call preset:** Call preset 28 or preset 95 to go to dome menu. Call preset 29 or preset 99 to go to scan. Call preset 24 or preset 81 to go to pattern. Call preset 25 or preset 82 to go to cruise (tour). Call preset 30 or preset 96 to stop scan or pattern. Call preset 31 or preset 83 to begin rotation. Call preset 33 to enable PTZ 180 degrees rotation. Call preset 34 to set dome position as 0.
- **Set preset:** Set preset 26 or 92 to set scan left limit. Set preset 27 or 93 to set scan right limit. Set preset 22 or 79 to begin record. Set preset 23 or 80 to stop record.

#### 4.4.4.2 Pan

```
PAN SPEED : 160
RUN
STOP
BACK
EXIT
```

Move the cursor to PAN button and then click confirm button to go to setup interface.

- PAN SPEED: Set dome rotation speed. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- RUN: Move the cursor to call item and then click confirm button. The dome begins 360 degrees continuous rotation.
- STOP: Highlight stop item and then click confirm button. The dome stops rotation.
- BACK: Go back to previous menu.
- EXIT: Log out system menu.

#### 4.4.4.3 Scan

```
SCAN NO : 001
SET LEFT LIMIT
SET RIGHT LIMIT
SCAN SPEED : 160
RUN
STOP
BACK
EXIT
```

Move the cursor to SCAN button and then click confirm button.

- SCAN NO : Here is to set auto scan number. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- SET LEFT LIMIT : Here is to set camera left address. Click confirm button to save current setup.
- SET RIGHT LIMIT : Here is to set camera right address. Click confirm button to save current setup.
- SCAN SPEED: The value ranges from 1 to 255. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- RUN: Please input auto scan number first, and then please move the cursor to RUN and click confirm button to activate auto scan function.
- STOP: Here is to terminate auto scan function.
- BACK: Go back to previous menu.
- EXIT: Log out system menu.

#### 4.4.4.4 Cruise (Touring)

```

CRUISE NO:      :001
CRUISE SETTING
DELETE CRUISE
RUN
STOP
BACK
EXIT

```

Move the cursor to highlight CRUISE item and then click confirm button to go to set interface.

- CRUISE NO : Here is to set tour number. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- CRUISE SETTING: Move the cursor to cruise setting item and then click confirm button. You can see the following interface. Here you can add or remove the preset, and set the corresponding dwell time and call speed. One cruise can max include 32 presets. The preset value ranges from 1 to 255.

NO	PRESET	DWELL	SPEED
01	000	005	013
02	000	005	013
03	000	005	013
...	...	...	...
32	000	005	013

- DWELL: Here is to set dwell time. The value ranges from 3s to 255s. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- SPEED: The speed value ranges from 1 to 16.

When you move the cursor to one cruise number, you can use left/right button to turn the page.

When you move the cursor to one cruise number, please click confirm button to set the cruise. Please use up/down button to set preset number, dwell time and speed. Use the left/right button to go to the next cruise. Click confirm button you can exit the setup. After you completed the setup, move the cursor to back button to go to the previous interface.

- DELETE CRUISE : Here is to delete a cruise. Input cruise number in CRUISE NO and then move the cursor to DELETE cruise, click confirm button to delete.

- CALL: Here is to activate cruise. Input touring number in touring NO and highlight CALL, click confirm button to activate touring.
- STOP: Here is to terminate touring.
- BACK: Go back to previous menu.
- EXIT: Log out system menu.

#### 4.4.4.5 Pattern



Pattern function can memory PTZ operation and camera focus zoom in and zoom out.

From the start position, dome begins auto movement repeatedly.

This series IP dome supports maximum 5 patterns and one pattern can max support 400 commands.

Move the cursor to PATTERN and click confirm button.

- PATTERN NO : Here is to set pattern number. Please click left/right key to configure.
- PROGRAM START: Here is to memorize pattern starting point. An icon OK pops up in screen to prompt you system begins memory pattern.
- PROGRAM STOP : Here is to set pattern stop point. After all the movement, move the cursor to PROGRAM STOP and then click confirm button. Now you have set one pattern. System pops up an icon OK to prompt you system has memories one pattern.
- RUN : Here is to activate pattern. Input pattern number, move the cursor to RUN and click confirm button, system begins running pattern.
- STOP: Here is to stop current pattern. Input pattern number, move the cursor to STOP and click confirm button. System stops current pattern.
- BACK: Go back to previous menu.
- EXIT: Log out system menu.

**Note:**

- The dwell time between two orders should be less than one minute, otherwise system will set to default value as one minute.
- After click PROGRAM STOP, do not click CALL button before icon “●” disappears completely.
- Any manual operation during the pattern procedure will terminate current dome pattern operation.

#### 4.4.4.6 Privacy Masking (Window blank)

**Please make sure you current camera supports this function.**

PRIVACY	NO	: 001
ACTIVATE		: OFF
RESIZE		: ↑
DELETE		
SAVE		
BACK		
EXIT		

Move the cursor to PRIVACY ZONE and click confirm button, system goes to privacy mask setup interface. The zone amount may vary due to different series product.

**Note:**

- For security reasons, please set privacy zone a little bit larger than the privacy object size.
- Each time, after modifications you need to move the cursor to SAVE button and then click confirm button to get all setup activated. Otherwise, privacy zone may not move correspondingly with the object.

Please enter privacy zone menu, now all the privacy zones are closed.

Move the cursor to PRIVACY NO, please use left/right key to set different privacy zones.

For example, shift to 001 section and then move the cursor to ACTIVATE.

Secondly, use left/right key to select ON mode. Now there is a privacy zone in the screen centre.

Thirdly, use PTZ to move camera so that privacy object fit well with screen centre.

Fourthly, move the cursor to RESIZE and then click left and right key to adjust privacy zone direction and size.

Fifthly, move the cursor to SAVE and then click confirm button to exit.

- PRIVACY NO : Here is to set privacy mask zones. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- ACTIVATE: There are two settings: on and off. When activate function is on, the privacy mask function will be activated and displays in the screen. When activate function is off, the privacy mask function will be closed and the blank will not displayed in the screen.
- RESIZE : It is to adjust the privacy zone size. Please continue pressing direction button to widen or narrow zone size. ← is to narrow the horizontal width and → is to widen the horizontal width. ↑ is to widen vertical height and ↓ is to narrow the vertical height.
- SAVE : Here is to save user setup.
- DELETE: Here is to delete setup and the privacy mask zone disappears. Click the OK button to set.
- BACK: Go back to previous menu.
- EXIT: Log out system menu.

#### 4.4.4.7 Idle Function

IDLE FUNC	: OFF
IDLE TIME	: 010MIN
IDLE ACTION	: PRESET
PRESET NO	: 001
AUTO SCAN NO	: 001
CRUISE NO	: 001
PATTERN NO	: 001
SAVE	
BACK	
EXIT	

When there is no available command for specified time, dome automatically goes on the previous set functions.

- IDLE FUNCTION : There are two modes ON/OFF. Please use left/right key to set.
- IDLE TIME: System idle period. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- IDLE ACTION: There are several functions you can select: NONE/PRESET/SCAN/TOURING/PATTERN. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- PRESET NO: Here is for you to set preset number. The value ranges from 1 to 255. System goes to specified preset when idle status is on.
- AUTO SCAN NO: The value ranges from 1 to 5. Please use the left/right button on the keyboard or in the speed dome terminal menu to set. System begins specified scan when idle status is on.
- CRUISE NO: The value ranges from 1 to 8. Please use the left/right button on the keyboard or in the speed dome terminal menu to set. System begins specified touring when idle status is on.
- PATTERN NO: The value ranges from 1 to 5. Please use the left/right button on the keyboard or in the speed dome terminal menu to set. System begins specified pattern when idle status is on.
- SAVE: Move the cursor to SAVE and click confirm button to save current setup.
- BACK: Go back to previous menu.
- EXIT: Log out system menu.

#### 4.4.4.8 Next Page

Move the cursor to the NEXT PAGE and then click the confirm button, you can go to the third menu to set the PTZ SPEED, SET ZERO, POWER UP and etc.

PTZ SPEED	: OFF
SET ZERO	
POWER UP	
MENU IDLE	
PTZ AUTO STOP	
HEATER SETTING	
SAVE	
BACK	
EXIT	

- PTZ SPEED: It is to set PTZ speed. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- SET ZERO: It is to set the PTZ initial position. Please move the PTZ to the corresponding position and then click the confirm button to complete the setup.
- POWER UP: It is to set the dome operation when the speed dome boots up. Click the confirm button to go to the next interface to set

- MENU IDLE: If current setup is ON, once you open the menu and leave it idle for specified period, the menu may automatically disappear. If current setup is OFF, the menu is always there and will not disappear. Please use the left/right button to set.
- PTZ AUTO STOP: The speed dome will stop all the PTZ operations when there is no command for the specified time. It includes various setups. Please use the left/right button to set.
- HEATER SETTING: Please highlight the current item and then click the confirm button to go to the next interface to set
- BACK: Go back to the previous menu.
- EXIT: Log out the system menu.

### Power Up

Move the cursor to the POWER UP item and then click the confirm button, you can go to the fourth menu.

```
POWER UP          : AUTO
PARAMTER         : NONE
BACK
EXIT
```

- POWER UP: It is to set the PTZ operation when the speed dome boots up. There are many options. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- PARAMTER: Here you can set the serial number of the corresponding operation such as the scan, preset, pattern, tour. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- BACK: Go back to the previous menu.
- EXIT: Log out the system menu.

### Heater Setting

Move the cursor to the HEATER item and then click the confirm button, you can go to the third menu.

```
HEATER SETTING   : AUTO
TEMPERATURE ENABLE : 03
TEMPERATURE DISABLE : 12
BACK
EXIT
```

- HEATER SETTING: There are several options. Please use the left/right button on the keyboard or in the speed dome terminal menu to set.
- TEMPERATURE ENABLE: The heater is on when the speed dome internal temperature is below the threshold you set here.
- TEMPERATURE DISABLE: The heater is off when the speed dome internal temperature is higher than the threshold you set here.
- BACK: Go back to the previous menu.
- EXIT: Log out the system menu.

### 4.4.5 IR Light Setup

```
IR SENSITIVITY: 4
IRLIGHT CTRL: ZOOM PRI
NEAR LIGHT: 50
FAR LIGHT: 50
IRLIGHT COMP: 03
BACK
EXIT
```

Move the cursor to highlight IR LIGHT SETTING button and then click confirm button.

- IR SENSITIVITY: Here you can enable the IR light sensitivity function.
- SWITCH ZOOM: It is the zoom rate of the near light, and far light.
- IRLIGHT CTRL: There are three options: Zoom rate has the higher priority, height has the higher priority, manual.
- NEAR LIGHT: It is the medium and near light brightness.
- FAR LIGHT: It is the far light brightness.
- IR LIGHT COMPENSATION: It is the whole compensation level of the IR light.

## **4.5 Dome Abnormal Phenomenon Operation**

### **4.5.1 Restore to Factory Default Setup**

From main menu-> SYSTEM INFORMATION, move cursor to FACTORY DEFAULT and click confirm button. Dome will reboot and all the setups restore to factory default setup.

### **4.5.2 PTZ Movement is not smooth**

From menu to SYSTEM INFORMATION, move cursor to RESTART and click confirm button. This reboot will not modify all activated setup (such as preset, tour and pattern)

## 5 FAQ

### 5.1 Daily Maintenance

Please clean dome cover regularly to get vivid image.

Handle the cover with care. Use water to wash. Don't use cloth to clean.

Use mild detergent to clean if there is too much dust.

**Note:**

The sweat from your hand may erode plating surface, your nail may scrape dome cover result in blur image.

### 5.2 Problems and Solutions

SYMPTOM	CAUSE	SOLUTION
1) No self-diagnosis, no video signal when I connect dome to power.	Red LED is not on. <ul style="list-style-type: none"> <li>● Your power supplying does not apply to the power. Or connection is too loose.</li> <li>● Power off or transformer problem.</li> </ul>	<ul style="list-style-type: none"> <li>● Check power is connected or properly earthed.</li> <li>● Check power supply condition or check transformer.</li> </ul>
	Red LED light on the power board is on <ul style="list-style-type: none"> <li>● Power supplying is low</li> <li>● Something wrong with power board.</li> </ul>	<ul style="list-style-type: none"> <li>● Use multimeter to check dome load.</li> <li>● Please contact retailer to replace power board.</li> </ul>
2) No self diagnosis. There is a noise	Power supplying is inadequate.	Replace power supplying.
	Mechanical malfunction.	Need electrical engineer help.
3) Self diagnosis is ok. No video signal	Power connection is too loose.	connect tightly
	Check the circuit connection.	Connect again
	Video switch connection is wrong or improper operation.	Please refer to user's manual for cable connection information.
4) Self diagnosis is o.k. but I can not operate the dome.	Control circuit is not properly connected	check control cable connection.
	Dome address, protocol or baud rate setup is not right.	Please refer to user's manual for detailed information.
5) Video signal loss occurs in high speed rotation.	Power supplying is not sufficient	Replace power supplying.
6) Video signal is not successive	Circuit connection is too loose.	Connect tightly.
	Video switch or power problem	Need electrical engineer help.
7) Video is not clear.	Focus is in manual mode.	Control manually.
	Dome cover is dirty.	Wash dome cover
8) During camera switch, there is a tilt movement in the monitor.	Camera power is not in the same Phase.	When several domes are connected to one transformer, please connect the transformer output cable to the domes' same side.

## 6 Appendix I Thunder Proof and Surge Protection

This series speed dome adopts TVS lightning protection technology. It can effectively prevent damages from various pulse signals below 1500W, such as sudden lighting and surge. While maintaining your local electrical safety code, you still need to take necessary precaution measures when installing the speed dome in the outdoor environment.

- The distance between the signal transmission cable and high-voltage device (or high-voltage cable) shall be at least 50 meters.
- Outdoor cable layout shall go under the penthouse if possible.
- For vast land, please use sealing steel tube under the land to implement cable layout and connects one point to the earth. Open floor cable layout is forbidden.
- In area of strong thunderstorm hit or near high sensitive voltage (such as near high-voltage transformer substation), you need to install additional high-power thunder protection device or lightning rod.
- The thunder protection and earth of the outdoor device and cable shall be considered in the building whole thunder protection and conform to your local national or industry standard.
- System shall adopt equal-potential wiring. The earth device shall meet anti-jamming and at the same time conforms to your local electrical safety code. The earth device shall not short circuit to N (neutral) line of high voltage power grid or mixed with other wires. When connect the system to the earth alone, the earth resistance shall not be more than  $4\Omega$  and earth cable cross-sectional area shall below  $25\text{ mm}^2$ . See Figure 6-1.

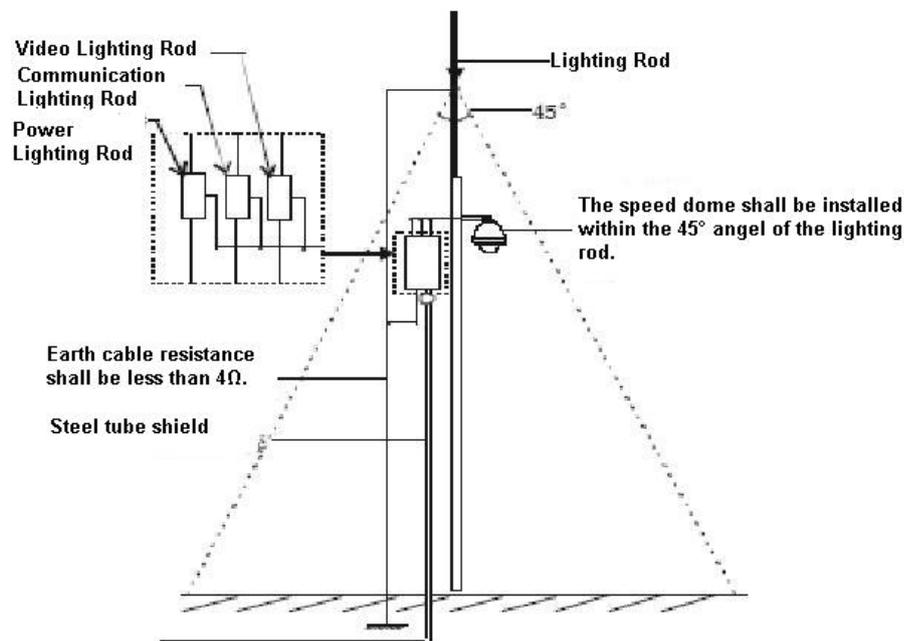


Figure 6-1

## 7 Appendix II About RS485 Bus

### 7.1 RS485 Bus Main Feature

RS485 is semi duplex communication cable of impedance  $120\ \Omega$  . Its max load amount is 32 effective loads (including main control device and devices to be charged).

### 7.2 RS485 Bus Transmission Distance

When we take 0.56mm (24AWG) twisted-pair as communication cable, the max transmission distance (theoretically) are listed below (according to different baud rates).

Baud Rate	Max Distance
2400 BPS	1800M
4800 BPS	1200M
9600 BPS	800M

In the following situations, the max transmission distance shall become shorter accordingly:

- The communication cable is a little bit thin;
- The surrounding environment has strong electromagnetic interference;
- There are too much devices connected to the RS485 bus;

And vice versa, the max transmission distance shall become longer.

### 7.3 Connection Methods and Terminal Resistance

1) RS485 bus requires all devices use the following connection methods. Both terminals shall have  $120\ \Omega$  resistance. See Figure 7-1.

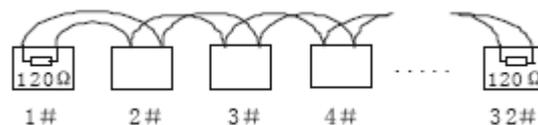


Figure 7-1

Or you can refer to for the simplified way as in Figure 7-2. But the distance between “D” shall not exceed 7M.

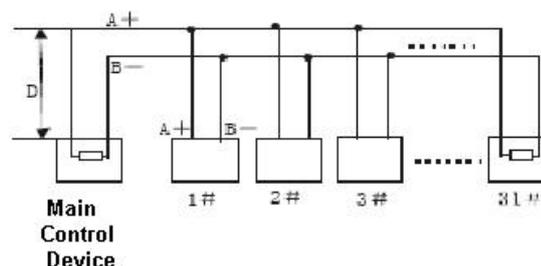


Figure 7-2

2) Please refer to chapter 2.1 for  $120\ \Omega$  resistance information on the main board.

### 7.4 The Problem in Practical Use

In practical usage, we usually adopt star type connection. The terminal resistance shall connect to the furthest two devices (Such as device 1# and device 15# in Figure 7-3 ). But this connection way does not

conform to RS485 Bus standard. When the distances between devices are too long, the signal reflection occurs and anti-jamming decreases, thus the signal reliability becomes very low. You can see speed dome is not under control or speed dome is running automatically and can not stop.

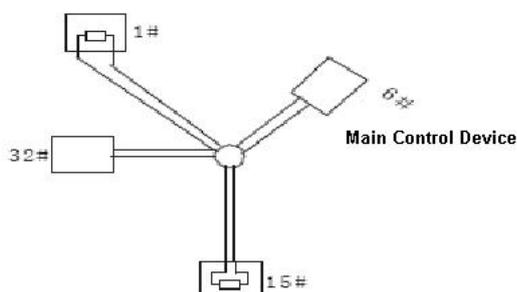


Figure 7-3

In this situation, we recommend RS485 distributor. This device can turn star type connection into the connection that conforms to RS485 bus industry standard, which can avoid the above mentioned problems and enhance communication reliability. See Figure 7-4.

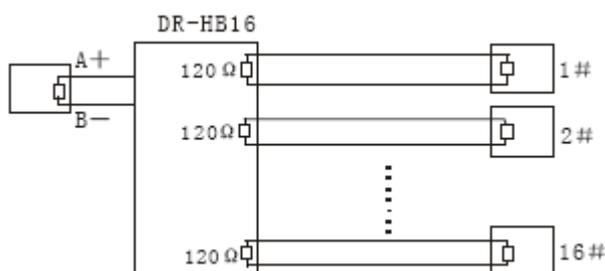


Figure 7-4

## 7.5 RS485 Bus FAQ

Phenomenon	Possible Reasons	Solution
Speed dome can run self-diagnosis but I can not control it.	<ul style="list-style-type: none"> <li>● Host address(baud rate) and speed dome address(baud rate) are not match;</li> <li>● Positive and negative end of RS485 Bus are misconnected;</li> <li>● Connection cable is loose;</li> <li>● RS485 Bus connection are cut off;</li> </ul>	<ul style="list-style-type: none"> <li>● Modify host or speed dome setup ;</li> <li>● Switch RS485 positive end and negative end;</li> <li>● Fix connection cable firmly;</li> <li>● Replace RS485 Bus.</li> </ul>
I can control the speed dome but is not smooth	<ul style="list-style-type: none"> <li>● RS485 Bus connection are not good;</li> <li>● One RS485 bus is off;</li> <li>● The distance between host and speed dome is too far;</li> <li>● Parallel connected too much speed domes.</li> </ul>	<ul style="list-style-type: none"> <li>● Connect RS 485 Bus again;</li> <li>● Replace RS485 Bus;</li> <li>● Add terminal matching resistance;</li> <li>● Add RS485 distributor.</li> </ul>

## 8 Appendix Toxic or Hazardous Materials or Elements

Component Name	Toxic or Hazardous Materials or Elements					
	Pb	Hg	Cd	Cr VI	PBB	PBDE
Sheet Metal	○	○	○	○	○	○
Plastic Parts	○	○	○	○	○	○
PCB	○	○	○	○	○	○
Housing	○	○	○	○	○	○
Camera Driver	○	○	○	○	○	○
Bearing	○	○	○	○	○	○
Connection Cable	○	○	○	○	○	○
Motor (If possible)	○	○	○	○	○	○
Power (If possible)	○	○	○	○	○	○
Bracket (If possible)	○	○	○	○	○	○
Accessories	○	○	○	○	○	○

### Note

O: Indicates that the concentration of the hazardous substance in all homogeneous materials in the parts is below the relevant threshold of the SJ/T11363-2006 standard.

X: Indicates that the concentration of the hazardous substance of at least one of all homogeneous materials in the parts is above the relevant threshold of the SJ/T11363-2006 standard.

### Note

- This manual is for reference only. Slight difference may be found in the user interface.
- All the designs and software here are subject to change without prior written notice.
- All trademarks and registered trademarks are the properties of their respective owners.
- If there is any uncertainty or controversy, please refer to the final explanation of us.
- Please visit our website or contact your local service engineer for more information.

