SEC-CAM901

SPEED DOME CAMERA

intelligent operating manual

SPEED DOME CAMERA intelligent operating

manual

Note::

- **Read this manual carefully before installation and operation. Keep it handy for later reference.**

CONTENTS

FEATURES

Product Features

- **Multiple Integrated Camera/Optics Packages**
- **Graceful outlook, Vandal proof available**
- **System preheat in low temperature environment**
- **Programmable Multi-protocol**
- **360° continuous pan, 180° Tilt "Auto Flip"**
- **4 tours(27 presets/tour), 4 patterns, 4 cruise**
- **8 titled zones**
- **Port for Software up-grade**
- **Built-in Alarm, 7 Inputs/2 Outputs**
- **Built-in Surge and Lightning Protection**
- **Speed Amplify to fit different control keyboard**
- **Auto Running Memory Against Power Outage**
- **Auto Running Resume after Manual Operation**
- **On-Screen display for compass and tilt angle, System and environment temperature, fan status**

Dome Drive Unit

- **360° continuous pan, 180°Tilt "Auto Flip"**
- **Discreet Liner with Sealed Fixed Bubble**
- **220 presets, ±0.1° preset accuracy**
- **300°/s Pan/Tilt Preset Speed**
- **4 tours max. 27 presets/tour**
- **4 patterns, 4 cruises, 8 titled zones**
- **OSD Menu password protection**
- **Built-in alarm, 7 input/2 output**
- **Multiple RS485 protocol/Coaxial**
- **Locations of Labels and On-Screen Displays**
- **Software Up-gradable**
- **FIFO alarm priority levels**
- **Alarm driven Pattern, preset etc.**
- **Position Resume After Alarm**
- **Variable Cruise Speed 0.1-150°/sec**
- **OSD Menu for Programmable Functions**
- **Proportional Pan/Tilt Speed**
- **Vertical Tilt Unobstructed 0° to -90°**
- **Auto Running Memory Against Power Outage**
- **Auto Running Resume after Manual Operation**
- **System preheat before camera power on**
- **On-Screen display for compass and tilt angle, System and environment temperature, fan status**

Electrical

- **Input Voltage 16-30 VAC; 24 VAC nominal**
- **Input Power 10 VA nominal (w/o heater)**
- **45 VA nominal (with heater)**
- **Fuse 1.25A**
- **Auxiliary Outputs 2 Alarm Inputs 7**
- **Built-in Surge Protection**
- **Limited Lightning Protection**

General

Construction

Back Box & Housing	**Die-cast Aluminum**
Dome Drive	**Aluminum, thermo plastic**
Bubble	**Acrylic/Poly Carbon**

Environment

Operating Temperature

Model	Absolute Max	Sustained Max	Absolute Min	Sustained Min
In-Ceiling Indoor	32° to 122°F (0° to 50°C)			
Standard Pendant	113°F (45°C)	95°F (35°C)	-4°F (-20°C)	14°F (-10°C)
Environmental Mount	140°F (60°C)	122°F (50°C)	-60°F (-51°C)	-50°F (-45°C)

Note:

1. Assume no wind chill factor

2. Prevents icing at sustained minimum of -50°F (-45°C)

3. De-ices 0.1 inch (2.5 mm) within 3 hours after power-up

Camera/Optics

Image Sensor	**1/4" Super HAD**
Resolution	**480TVL**
Lens	**22X f=3.6~79.2mm**
Digital Zoom	**22X10**
Angle of View	**47°~2.2°**
Sync system	**Internal/external**
Min. Illumination	**0.25Lux**
S/N Ratio	**>48db**
Iris	**Auto/Manual**
White Balance	**Auto/Manual**
Gain	**Auto**
AE Control	**Auto**
BLC	**On/Off**
Privacy Mask	No
Focusing system	**Auto**
Video Output	**1.0±0.2Vp-p**

DECLARATION

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.

■ PRECAUTIONS:

- **Only qualified and experienced person can carry out the installation. In many countries and areas licensed personnel is required**
- **Always take safety codes into consideration during installation.**
- **Use reliable tools only, poor quality tools may cause damage to both human and property**
- **Check the strength of all item onsite that are related to installation in advance. It is recommended that the stand of dome be 8 times stronger than the weight of the dome and its accessories.**
- **Keep all the original dome package materials in case of future repacking and transportation.**
- **Choose and install speed dome according to environment requirement (Refer to the Product Features). This product conforms to IP66 standard as specified in "Housing Protection Classification (IP code)".**

■ WARNINGS:

- **Avoid installing this speed dome in hazardous places where inflammable or explosive materials are stored or used.**
- **Indoor dome is not designed for outdoor environment.**
- **This speed dome runs on 24v AC.**
- **Connect to power only after completing installation.**
- **Disassemble can only be carried out by qualified personnel.**
- **Use soft towel to clean the down cover when necessary. Avoid using caustic detergent.**
- **Avoid aiming camera to strong light.**

INSTALLATION PREPATATION

■TOOL LIST:

Following tools may be needed for the installation:

1. **Screws and nuts**
2. **Philips screw driver**
3. **Standard screw driver**
4. **Wire scissors**
5. **Ladder**
6. **Drill**
7. **Saw.**

■CABLE:

8. **Video Coaxial Cable**
9. **75Ω impedance,**
10. **Solid copper wire,**
11. **95% braided copper shield.**

Check the max transmission distance referring to the chart below.

Model	Distance
RG 59/U	750ft(229m)
RG 6/U	1,000ft(305m)
RG 16/U	1,5000ft(457m)

12. **RS485 Cable**
13. **0.56mm (24AWG) twisted pair wire**

■DIP SWITCH SETTING

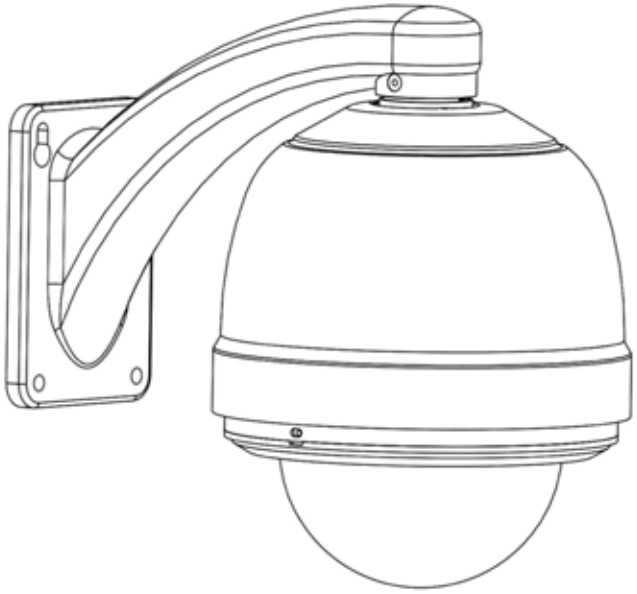
See appendix I :

14. **Protocol and Baud rate**
15. **Dome address**
16. **Video cable type**
17. **Resistor jumper**
18. **Alarm output method**

◆

MOUNT TYPE

■WALL MOUNT

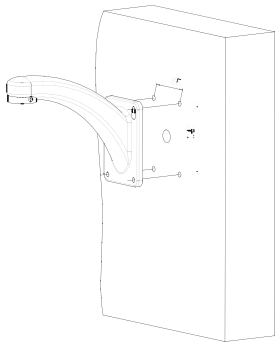


INSTALLATION GUIDE

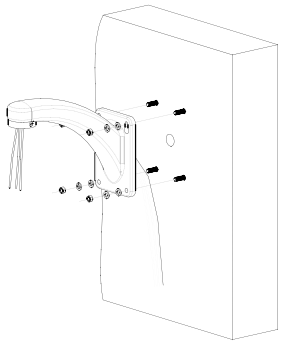
■ WALLMOUNT

Check carefully to make sure the wall is firm and does not peel off. It is required that the wall can withstand 8 times weight of the dome set.

1. Mark mounting position
Use bracket to mark the mounting position on wall



2. Install bracket.
Conduct all cables through the hole of bracket, and fix bracket on the wall



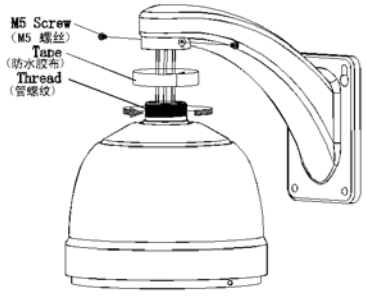
3. Release the connection board。

Unscrew to release the circuit board on connection board

4. 4. Install housing

Conduct cables through the hole on top of the housing. Align the fast connector to bracket and fix with 2 M5 screws.

NOTE: Apply water-proof tape to the thread in the case of outdoor dome.

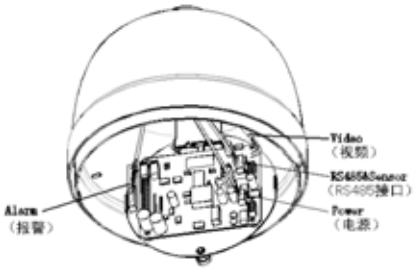


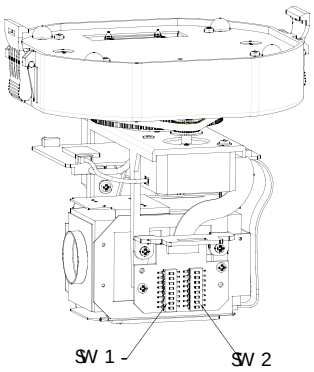
5 Connect cables.

Plug cables into corresponding sockets on circuit board. Reinstall the circuit board and turn on the power. The red LED is on if connections are correct. Turn off the power after checking.
NOTE: Names of the interfaces are marked on terminal block or PCB. Connect cables as picture shows. Make sure power is off before connecting.

6. Set dome ID, baud rate and protocol.

Set dome ID, bard rate and protocol by configuring DIP switches (see APPENDIX I). Remove the packing sponges.



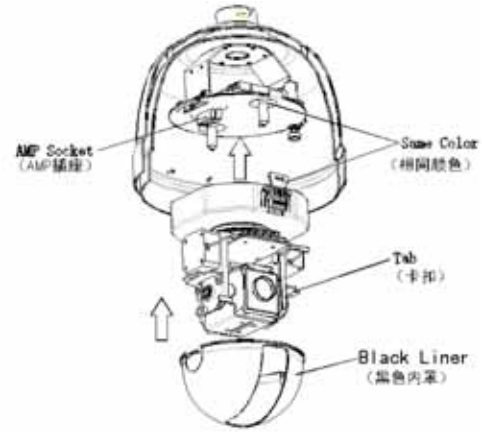


7. Down cover preliminary installation.

Attach the safety chain with a M3 nut as picture shows.

NOTE: Plug the heater wiring into socket on heater in the case of outdoor dome

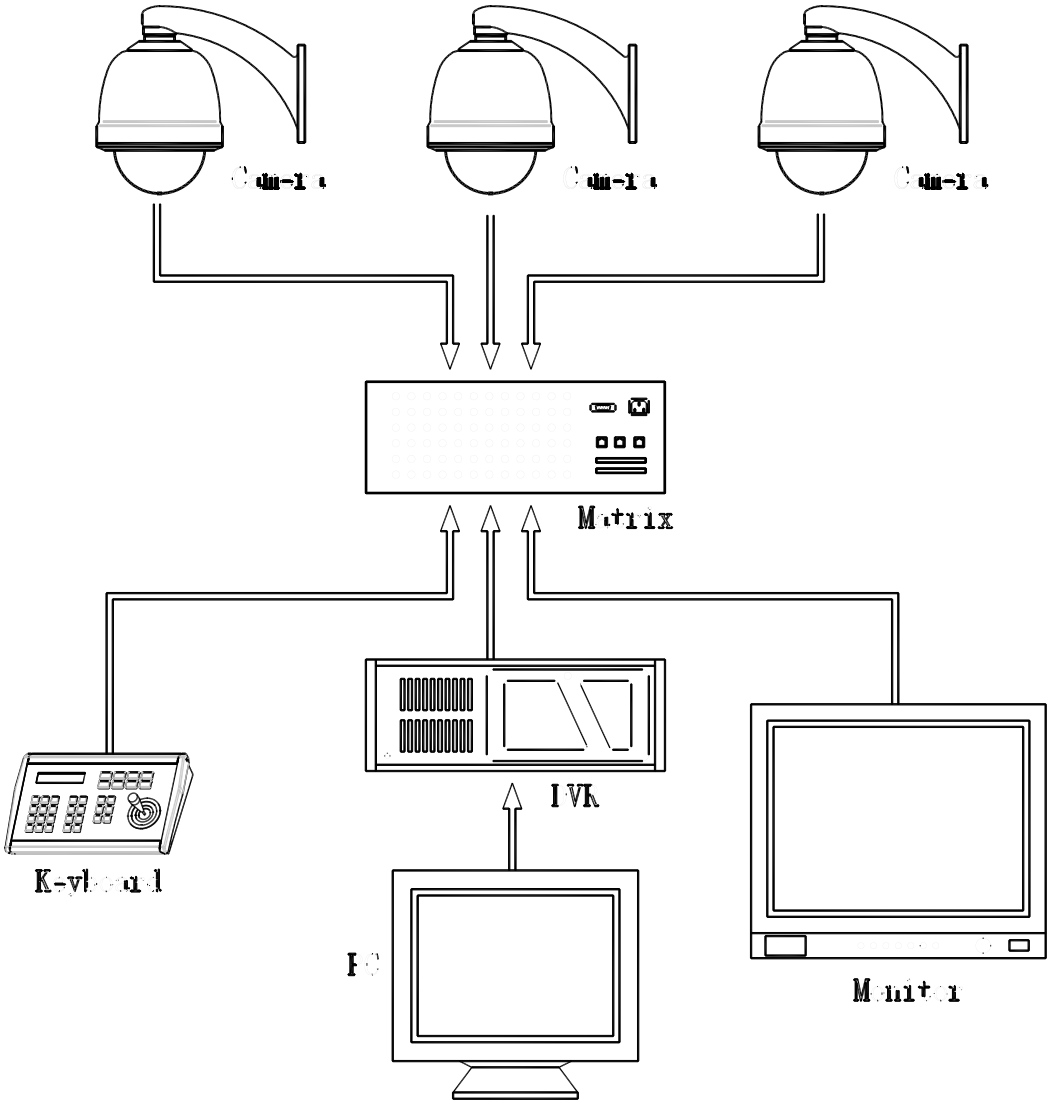
8. Install black liner and Pan/Tilt Module. Push the black liner into the two tabs. Install the pan/tilt module with two clips, match color of AMP sockets. Gently push the module upward until hearing the click. NOTE: Remove the lens cover



9. Install down cover

Unscrew the two M4 screw on down cover ring. Push up the down cover into the housing and then fasten down cover with two M4 screws.
NOTE: Apply lube to the O-ring in the case of outdoor dome

SYSTEM CONNECTION



OPERATION INSTRUCTION

Speed dome can be driven through combination of hot keys on a keyboard controller. It can also be driven through OSD menu. OSD menu can be activated by preset #95 call or double calling preset 1 (call twice within 5 seconds). Preset calling can be done through a keyboard controller or any other device (e.g. a computer) that can send proper command to the speed dome.

OSD menu operations are specified as follow:

■ PREHEATING SCREEN

When power on the dome and system temperature is under -15C/5F， following screen shows up:

```
Outer Temp :-030C/-022F
System Temp: -020C/-004F
Fan Speed   :6480rpm
System Under -15C/5F
System Heating Up
Please Wait……
```

System heats up till the system temperature is above -15C/5F. System starts to boot up after heating up finishes.

- **< Outer Temp >**
  Environment temperature XXC/XXF C：
  Celsius；F：Fahrenheit
- **< System Tem >**
  System inner temperature
- **< Fan Speed >**
  The rotating speed of fan.

■ BOOT-UP SCREEN

When power on or restart the dome, the boot up information will display on screen and then the dome will conduct self-testing. "System booting up…" will show on the screen until "boot-up success" shows up. The whole boot up process lasts about 40 seconds. This screen display disappears once the dome receives any effective command.

```
Protocol     : Ernitec
Baud Rate    : 4800BPS
Camera ID    : 001
Camera S/N : 8888888888
Model        : ----------
Version      : 1.20
Outer Temp :022C/071F
System Tem:027C/080F
Fan Speed    :6480rpm
     Booting Up… …
```

Dome control protocol.

- **<Baud Rate>**

  Dome control baud rate。

- **<Camera ID>**

  The dome ID address set by dip-switch or keyboard. (See APPENDX I)

- **<Camera S/N>**

  Camera serial number。

- **<Model>**

  Speed dome model number.

- **<Version>**
  Hardware and software version。

```
Protocol     : Ernitec
Baud Rate    : 4800BPS
Camera ID    : 001
Camera S/N : 8888888888
Model        : ----------
Version      : 1.20
Outer Temp :022C/071F
System Tem:027C/080F
Fan Speed    :6480rpm
     Bootup Success
```

■ ACCESSING MAIN MENU

- **Display the dome's main menu on your monitor by calling preset 95 or calling preset 1 twice within 5 seconds.**

  Note: For third party keyboard controller please read manuals. As command to a preset may not be the same among different manufacturers.

- **In case password protection is in effect, user needs to input the correct 6-bit password to enter the OSD menu. (Default password is 123456).**

- **To enter password, move the joystick up or down to select number (0-9), move the joystick left or right to choose password digit. If the input password is wrong, the password input window will disappear.**

minute without any operation. All the settings will be saved automatically to protect against power outage.

MENU OPERATION

■ SELECTING ITEM

In the main menu, the cursor flashes on the left side. Move the joystick up or down to point to the desired item. And then, move the joystick right to select the item.

Select an item to enter its sub menu or run a specific function or change its value or edit its title.

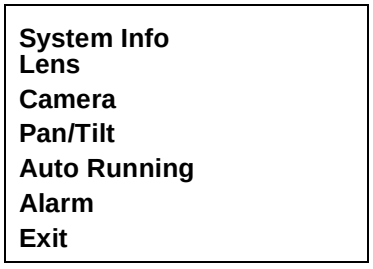
■ CHANGING VALUES

Move the joystick up or down to change the value, move the joystick left to save the setting and exit. In the case of multiple digits value, move left or right to select digits, move up or down to change value, move left to save the setting and exit.

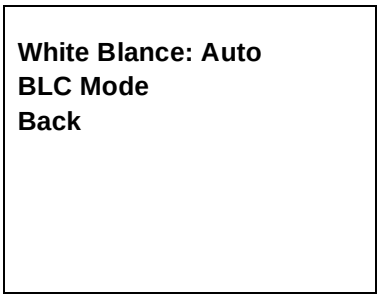
Note: To increase the value changing speed, hold the joystick up or down for more than 10 seconds.

For example: In order to change BLC LEVEL, please follow these steps:

1. **Call preset 95 or call preset 1 twice within 5 seconds to access the Main Menu.**



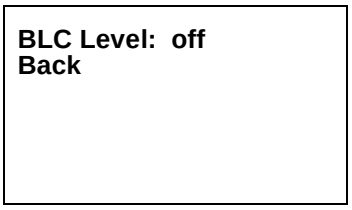
2. **Move the joystick down to point the cursor to <Camera >, move the joystick right to select it. Select BLC MODE in the same way**



NOTE: Here-in-after menu paths are written in the following format:

<Main Menu> → <Camera > → <BLC Mode> → <BLC Level>

3. **The <BLC Level> option blinks. Move the joystick up or down to change the option, move the joystick left to save the changing.**



When finished, select <Back> to return to upper menu.

SYSTEM INFO

■SYSTEM INFO

<Main Menu> → <System >

```
Site Info
Display Setup
Bootup Screen
Password
Set Default
System Reboot
Back
```

SYSTEM INFO includes following settings.

- **<Site Info>**
  Dome ID, name, broadcast address.
- **<Display Setup>**
  Screen display.
- **<Bootup Screen>**
  Display boot-up information.。
- **<Password>**
  Change password.
- **<Set Default>**
  Restore factory default settings.
- **<Reboot System>**
  Reboot dome system.

■SYSTEM INFO

<Main Menu> → <System > → <Site Info>

```
Site ID: 007
Name: 0000000000
Broadcast Add: 255
Back
```

<Site ID> shows the current dome's ID. Each dome has its unique ID. ID ranges from 001 to 254.

NOTE: <Site ID> can be set by menu only when DIP switch is set to programmable ID.

Move the cursor to <Site ID> and then move the joystick right to enter dome ID setting, sub-menu as follow.

```
Site S/N :8888899999
Input S/N:0000000000
```

Move the cursor to <Input S/N> and then move the joystick right, input the serial number according to the <Site S/N>, and then turn the joystick left to exit setting. Point cursor to <Back>, and turn joystick right to exit. Finally, turn joystick up or down to select desired ID number. When finished, move the joystick left to save the settings.
<Name> is the title of the dome. Assigning a name to a dome helps user to remember which dome it is. <Broadcast Add> is used to set broadcast ID number. The ID functions the same as dome's site ID, default setting is 255. The dome responds to commands sent to either ID. Refer to <Changing Values> to learn how to set broadcast address)

Select BACK to return to upper menu.

■DISPLAY SETUP

<Main Menu> → <System > → <Display Setup>

```
Site Name: On
Preset Title: On
Cruise Title: On
Pattern Name: On
Zoom: On
Orientation: On
Zone Name: On
Back
```

By switch on and off user can choose the items to display on screen when the dome is running.

- **<Site Name>**
  Choose to display site name.
- **<Preset Title>**
  Choose to display cruise title when the dome is cruise.
- **<Cruise Title>**
  Choose to display preset title when calling preset.
- **<Pattern Name>**
  Choose to display pattern title when the dome is replaying pattern sequences
- **<Zoom>**
  Choose display the current zoom times。
- **<Orientation>**
  Choose to display the current lens pointing

- **<Zone Name>**
  Choose to display the current zone title
- **Select <Back> to return to upper menu**

■ BOOT-UP SCREEN

<Main Menu> → <System >→ <Bootup Screen>

```
Protocol      : Ernitec
Camera ID : 001
Baud Rate : 9600bps
Protocol : Default
Model : ……
Version : 1.20
Outer Temp :022C/071F
System Tem:027C/080F
Fan Speed    :6480rpm
Call Preset 1 To Back
```

Boot-up info displays summary information of the dome. Values are fixed in this sub-menu. Refer to "Boot-up Info" to check the item. Call preset 1 to return to upper menu.

■ PASSWORD

<Main menu> → <System > → <Password>

```
Input Password:******
Confirm          :******
PSWD Protection: On
Back
```

- **<Input Password>**
  Move joystick right to enter submenu.

```
Old Password:******
Back
```

- **< Old Password >**
  Enter the old password.
- **< Back >**

If old password is correct, cursor goes back behind <Input Password>, so that new password can be input. If old Password is not correct, cursor goes back to front of <Input Password>. Password can not be changed in this case.

- **<Confirm>**
  When and only when new password is entered, user can get to this menu item. If password is not the same as entered the first time, it remains unchanged..
- **< PSWD Protection>**
  Switch on and off the password protection.
  to access main menu or save preset through keyboard.
  NOTE: The dome's default password is 123456. Contact the supplier for the master password if forget the password after changing.
  Select BACK to return to upper menu

■ SET DEFAUT

<Main Menu> → <System Info> →<Set Default>

```
Site Info
Display Setup
Initial Information
Password
Set Default
System Reboot
Back
```

Select <Set Default> to restore factory default settings.

List of Default Settings:

Item	Default Value
Zoom Speed	High
Digital Zoom	Off
AI/AF Resume Mode	Both
AF Resume Time	005
AF Resume Time	005
Iris ALC	084
Iris PlC	016
Day/Night	Auto
all display config	Off
Frame Limit	1/25
Shutter	Off
Exposure	Off
White Balance	Auto
BLC Level	000
Speed Amplify	Off
Proportional P/T	On
Pswd Protection	Off
Park Time	Off
Park Action	Off
Arm/Disarm	Disarm
Reset Delay	004

■ SYSTEM REBOOT

<Main Menu> → <System > →

<System Reboot>

```
Site Info
Display Setup
Initial Information
Password
Set Default
```

Back

Select <System Reboot> to reboot the dome. Settings will not change after restarting

LENS PARAMETERS

<Main Menu> → <Lens>

Digital Zoom : Off
Joystick AF/AI : Both
AF Resume Time: 005
AI Resume Time : 005
Iris ALC Value : 042
Day/Night : Auto
Back

■ DIGITAL ZOOM

<Main Menu> → <Lens> → < Digital Zoom>

Digital zoom magnify the picture by duplicating pixels. The picture is enlarged but the resolution remains unchanged.

[Off] Turn off digital zoom (Default setting)

■ JOYSTICK AF/AI

<Main Menu> → <Lens> → <Joystick AF/AI>

Set automatic restore mode. When the joystick moves, the selected function will be triggered. Options are:

[Both] Joystick movement triggers both auto focus and auto iris (default).
[Focus] Joystick movement triggers auto focus only.
[Iris] Joystick movement triggers auto iris only.
[None] Joystick movement triggers none of the functions.

■ AF RESUME TIME

<Main Menu> → <Lens> → <AF Resume time>

automatically adjusts the focus to get the clear image.
Focus can also be manually controlled by keyboard or matrix. For manual operation details, please refer to keyboard or matrix operation manual.
This item sets the time to restore auto focus after focus is manually changed. The default setting is 005.
[Off] Never restore auto focus after switch to manual.
[001-255] The dome will start auto focus that number of seconds after user manually adjust focus.

NOTE: The camera may not be able to auto focus in the following circumstances:

- **Target is not in the center of image.**
- **Near and far targets in the same picture can not be both clear.**
- **Target is a strong light object. Such as spot light etc.**
- **Target is behind the glass with water drop or dust.**
- **Target moves too fast.**
- **Large area target such as wall.**
- **Target is too dark or vague.**
- **<Joystick AF/AI> is set None or <Joystick AF/AI> is set [Iris], and Auto Focus is set to [off].**

■ AI RESUME TIME

<Main Menu> → <Lens> → <AI Resume Time>

Light goes through iris and reach CCD to form an image. Larger iris lets more light goes through and the image will be brighter. Iris can be controlled automatically or manually. For manual operation detail, please refer to keyboard or matrix manual.
[Off] Never restore auto iris after switch to manual.
001-255 The dome will start auto iris that number of seconds after user manually adjust iris。

■ IRIS ALC

<Main Menu> → <Lens> → <Iris ALC Value>

Set the iris average level control value. The value could be 000~255. Default value: 23X color/mono camera: 084

NOTE: Keep the default value is strongly recommended..

CAMERA PARAMETERS

<Main Menu> → <Camera>

```
White Balance: Auto
BLC Mode
Back
```

■ WHITE BALANCE

<Main Menu> → <Camera> → <White Balance>

White balance is normally compensated for by the automatic white balance gain control. In some lighting conditions, user may want to manually adjust the red and blue settings for optimal viewing. The setting options are:
[AUTO] Auto white balance (default setting).
[MANUAL] Manually set the red and blue values. Move the joystick right to enter the manual setting. The following window will appear.

```
WB-R : 000
WB-B : 000
Back
```

【R Gain (000-255)】 Adjust RED color depth。
【B Gain (000-255)】Adjust BLUE color depth。

■ BLC MODE

<Main Menu> → <Camera> → <BLC Mode>

R Gain (000-255), Adjust RED color depth.
B Gain (000-255), Adjust BLUE color depth.

If the backlight is bright, the objects in the center of the picture may appear dark. The dome can auto adjust the brightness of the whole image according to the brightness of center point. Thus backlight compensation can increase the brightness of the objects in the center of the picture.
If the backlight is too dark, the object on the center of the picture may appear dark. So, backlight compensation can decrease the brightness of the object.
Select BLC MODE and the editing menu will pop up.
[000] Disable backlight compensation function.
001-255 Choose different backlight compensation grade. Greater value means more back light.

```
BLC Level: 000
Back
```

■ AUTO STOP TIME

<Main Menu> → <Pan/Tilt> → <Auto Stop Time>

For some particular protocols, the dome will not stop moving even there is no operation on joystick. This menu item sets the time after which the dome receives last control command.

[Off] Disable this function (default setting)
[001~255] The time (unit : 50ms) that dome will stop moving without receiving any commands。

■ SPEED AMPLIFY

<Main Menu> → <Pan/Tilt> → <Speed Amplify>

Some protocols' controlling speed is much lower, set [Speed Amplify] to accelerate domes movement. Options are as below:

[Off] Disable this function (default setting)
[01× ~ 32×] Times greater than original speed.

■ PROPORTIONAL P/T

<Main Menu> → <Pan/Tilt> → <Proportional P/T>

The dome moves at a speed of certain degree per second. Objects on screen move much faster in wide scope than in tele-scope. Even too faster in some case. This function decreases the dome movement speed while zooming in.

[On] Enable (default setting)
[Off] Disable

■ SET NORTH

<Main Menu> → <Pan/Tilt> → <Set North>

joystick to position north

When select <Set North>, following menu will pop out.

[Back] Select it to back to main menu.

NOTE: Be better to set geographic north.

AUTO RUNNING

<Main Menu> → <Auto Running>

```
System Info
Lens
Camera
Pan/Tilt
Auto Running
Alarm
Exit
```

■ PRESET

<Main Menu> → <Auto Running> → <Preset>

```
Preset
Tour
Pattern
Cruise
Zone
Park Time: Off
Park Action: Off
Back
```

"Preset" is the point that user save for frequent use. A "preset" saves both direction and zoom parameter, the camera will quickly and precisely go and zoom to a specific point if a "preset" is called. E.g. If you often want to watch the door, you can set the point of door as a "preset", then you can survey the door simply by calling the "preset".

NOTE: 220 presets can be set.
<Preset No>: Display current preset number, the value ranges from 001 to 220. Move joystick up or down to select desired number.
<Title>: To set current preset title. Move the joystick right to enter <Title>, and then move joystick right to desired bit and move the joystick up or down to select desired letter.

```
Preset Number : 001
Title: PRE1
Set Current
Test Current
Auto Stop Time: Off
Speed Amplify: Off
Proportional P/T: Off
Set North
Back
```

```
Remove Current
Back
```

NOTE: You can edit 16 bits of letters at most. If you are not familiar with the editing, please refer to "Operation Instruction".

SETTING Select this item to set the preset position and zoom. The following menu will pop up when < Set Current > is selected

```
Call Preset 1 To
Confirm…….
```

Move to the desired position and zoom to a suitable level, call preset 1 to save the current preset.

< Remove Current> Select it to delete the preset with the number and title display above. <Back> Select it to back to upper menu.。

■ TOUR

<Main Menu> → <Auto Running> → <Tour>

```
Tour Number : 001
Dwell: 001
Edit
Test
Run
Back
```

A "tour" is a sequence of presets. When running a tour the camera moves from preset to preset and dwell for specific time for each preset. It is useful if you need to repeat switching among a number of presets. E.g. A shopping mall has several entrances. A tour can automatically loop the position of each entrance.
NOTE: 4 tours can be set in the system. Each tour can contain up to 27 presets and the dwell time for each preset is independent.
<Tour Number.> shows current tour number. Values are 001–004.

each preset. Value ranges from 0~99. For example, DEFAULT DWELL: 001, all presets' dwell time is set as 1 second, but user can still set independent dwell time for each preset in <Edit> menu.
<Edit> Edit presets and corresponding dwell time in a tour as follows.。

```
Preset-Dwell
001-001 002-004 003-002
004-001 000-001 000-001
000-001 000-001 000-001
000-001 000-001 000-001
000-001 000-001 000-001
000-001 000-001 000-001
000-001 000-001 000-001
000-001 000-001 000-001
000-001 000-001 000-001
Save And Back
Cancel And Back
```

Item format is Preset number-Dwell time

For example 003-02 means go to preset 003 and dwell for 2 seconds. Move joystick left or right to select editing item. Move up or down to change value.

In the above example the tour starts from preset 1 dwells for 1 second, then goes to preset 2 dwell for 5 seconds, then preset 3 for 2 seconds and finally preset 4 for 1 second.
<Save and Back> Save the tour and exit
<Cancel and Back> Quit without saving

NOTE: When a preset dwell time is set 0, system will skip that preset. System will consider preset 0 as the end of a tour.

NOTE: No delete function applied to tour, edit it again to replace the previous data.

<Test>: To run the current tour once. Use this function to check the tour.
<Run>: To run the current tour continuously. System will loop the tour.

<Back>: Back to upper menu.

■ CRUISE

<Main Menu> → <Auto Running> → <Cruise>

```
Cruise Number : 001
Left Position
Right Position
Default Speed: 001
Run
Back
```

NOTE: Camera pans only.

NOTE: Zoom to desired level then run auto scan, the camera will keep that zoom.

This speed dome has max. 4 cruise lines.

<Cruise Number>
Display the current auto scan number. Values are 001~004. Move joystick right then up or down to select values.

<Left Position>
Set the position of site A.
Following menu will pop up.

```
Call Preset 1 To
Confirm……
```

Move the camera to the desired position and call preset 1 to save.

<Right Position> set another site's position. Set it in the same way as <Left Position>

<Cruise Speed> Set the scanning speed (camera movement speed). Value ranges from 001 to 255, the greater number represents the higher speed. Move joystick right to select, up or down to change the value.

<Run> Start the current auto scan (001~004)
<Back> Back to upper menu.

■ PATTERN

<Main Menu> → <Auto Running> → <Pattern>

```
Pattern Number: 001
Record
Test
Run
Back
```

Pattern is a replay of recording of irregular pan/tilt/zoom operation. It is useful when repeating variable speed movement of the pan/tilt/zoom.

Note: There can be as many as 4 patterns recorded, each not more than 3 minutes.

<Pattern Number:> Display pattern number, value options are 001～004。

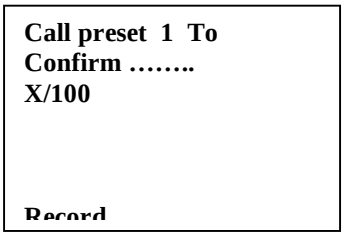
<Record> Record pattern

<Test> Test recorded pattern

<Run> Run Pattern until other command received

<Back> Back to upper level menu

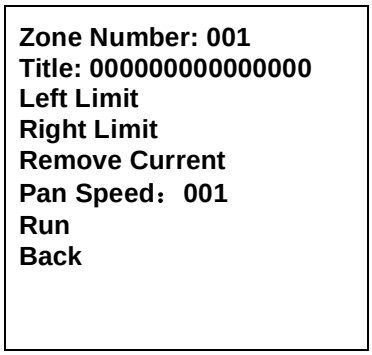
When getting into <Record> following menu pop up.



User can operate dome doing pan/tilt/zoom as needed. The system records the operation. To end recording user can call preset 1 to confirm. The current pattern recording is finished.

■ ZONE

<Main Menu> → <Auto Running> → <Zone>

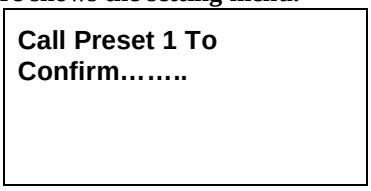


A zone is an area between two points. User can set a zone and scan it automatically.
<Zone> is similar to <Cruise> except user can assign a title for a ZONE. Whenever the camera moves into the zone, the title will display on the screen to alert the operator.

NOTE: Camera scans horizontally only. User can set up to 8 zones.

◆ **<Zone Number.>**
Display current zone number. Values are 001~008. Pan right then tilt up or down to select desired value.
◆ **<Title>**
Set the zone title. Select the desired letter or number. Repeat above procedure to complete the title editing.

Set the position of the first point. The following picture shows the setting menu.



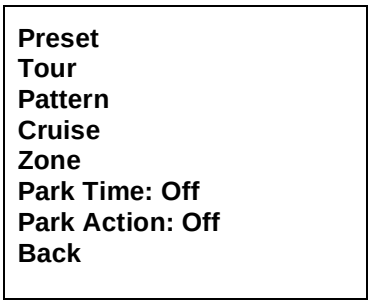
<Speed> Set the scanning speed (camera movement speed). Value ranges from 001 to 255, the greater number represents the higher speed. Pan right to select, tilt up or down to change value.

RUN To start scanning the current zone (001~008).
BACK Back to upper menu level.

◆ **<Pan Speed>**
Setup pan speed

■ PARK TIME

<Main Menu> → <Auto Running>



This function let the system automatically run an assigned function after a specific period of idle time. For example: the dome is running a tour and an operator breaks the tour to do other work, the dome can automatically carry on the tour within a period of time after the operator stops his operation.

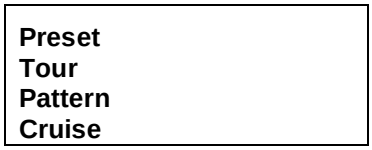
◆ **<Park Time>**
Park time means a period of idle time without any operation.
The values includes: OFF, 001~255.
[Off]: Disable this function.
[001~255]: Auto run a function after the number seconds of idle time.

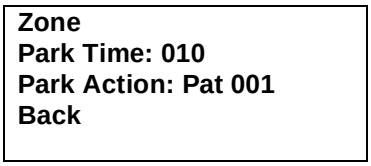
◆ **<Park Action>**
Park action refers to the function that system will automatically run when park time is up.

The function could be:

[Pre 001~220] Call preset 001~220
[Scan 001~004] Run auto scan 001~004
[Tour 001~004] Run tour 001~004
[Pat 001~004] Run pattern 001~004

◦

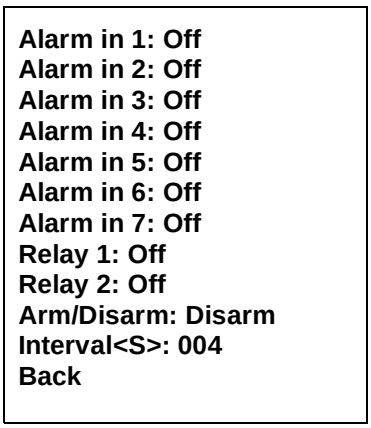




In this example, system will run Preset-8 after 38 seconds of idle time

ALARM

<Main Menu> → <Privacy Mask>



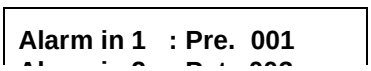
This model of speed dome has 7 alarm input channels and 2 output. Alarm input signal can come from other devices such as infrared detector and alarm output signal can go to light and DVR etc.

◆ **<Alarm in 1 ~ Alarm in 7>**
Channel 1 has the highest priority and channel 7 has the lowest priority. Set the alarm input and the dome's corresponding action. Following options are applicable.

[Off] Disable the alarm input (default)
[Pre 001~220] Call preset 001~220
[Scan 001~004] Run auto scan 001~004
[Tour 001~004] Run tour 001~004
[Pat 001~004] Run pattern 001~004

NOTE: There are two alarm output methods: NO and NC, refer to Appendix I for setting details.

For example:



Alarm in 4 : Tour 001
Alarm in 5 : Off
Alarm in 6 : Off
Alarm in 7 : Off
Relay 1 : Off
Relay 2 : Off
Arm/Disarm: Arm
Interval <S>: 004
Back

In this example, when the first alarm is activated, the dome will run preset-100; when the second alarm is activated, the doom will run pattern-3; when the third alarm is activated, the doom will run scan-2; When the fourth alarm is activated, the doom will run tour-1.
ALARM OUT 1,2 Alarm out relays the alarm input signal to other devices. e.g. light and DVR. Change the option to switch the alarm output ON or OFF. Default setting is OFF

◆ **<Arm/Disarm>**
Arm or disarm the alarm system and show the status.
◆ **<Interval >**
Set the time after which the alarm will be reset. Values are in second unit, default setting is 4.

[001~255] Reset within the number of seconds.

◆ **<Back>**
Back to main menu.

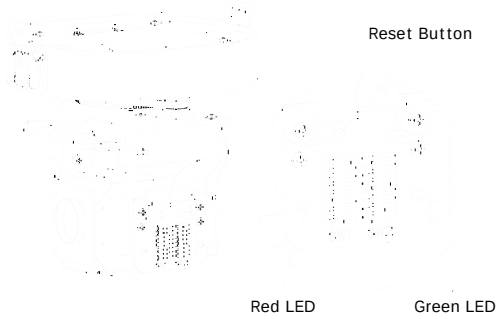
APPENDIX I:
DIP SWITCH SETTINGS

This is the guides for setting protocol, baud rate, dome address, video cable type, resistor jumper and alarm output.

◆ ◆ **DIP Switches' position**

The corresponding Dip-switches' positions are shown below:

:



◆ ◆ **Protocol and baud rate setting**

SW1 is for protocol and baud rate settings. Bits 1~6 of SW1 are for protocol setting and bits 7~8 are for baud rate setting as shown in the chart below

Default setting is 4800 bps.

Baud Rate	Switch Digits							
	1	2	3	4	5	6	7	8
2400							OFF	OFF
4800							ON	OFF
9600							OFF	ON
19200							ON	ON

◆ ◆ **Reset Button**
This button is for resetting the dome after changing the dipswitch setting. The new setting works only after reboot finishes.

◆ ◆ **Led**
Flashing green light means control commands reach the dome.
Red light is on when effective command

This model of speed dome supports multi-protocol. The set-ting chart is shown below.

Protocol	Switch Number							
	1	2	3	4	5	6	7	8
ERNITEC								
YAAN	ON							
ALEC		ON						
PELCO_PD	ON	ON						
PELCO_C			ON					
VCL	ON		ON					
MOLYNX		ON	ON					
VICON	ON	ON	ON					
DIAMOND				ON				
KALATEL	ON			ON				
HUNDA		ON		ON				
LILIN	ON	ON		ON				
SANTACHI			ON	ON				
PELCO_PDC	ON		ON	ON				
UNIVISIONV1*		ON	ON	ON				
UNIVISIONV2*	ON	ON	ON	ON				
AD*					ON			
ADT	ON				ON			
PANASONIC		ON			ON			
PHILIPS*	X	X	X	X	X	ON		
Reserved4								
Reserved5								
Reserved6								
Reserved7								
Reserved8								
Reserved9								
Reserved10								
Reserved11								
Reserved12								
Reserved13								
Reserved14								
Reserved 15								

◆ **◆ Dome address setting**

The control commands contain target dome's ID. The dome only reacts to the command sent to its own address or broadcast address.

Each dome should be assigned an address. Four kinds of IDs are applicable for domes:

1. **Hard ID:**
   Hard ID is set via DIP SW2 can not be changed from OSD menu. Hard ID ranges from 1 to 254.

2. **Programmable ID:**
   Set all 8bits of SW2 to ON to activate soft address. Input 10-bit camera SN number, and then set dome ID by controller (The dome SN number can be found on the side of the camera or on the package and user manual.).

3. **Broadcast ID:**
   Broadcast ID is programmable.
   When broadcast ID is available, all domes connected to the control bus will react to the command. The default broadcast ID is 255.

SW2 is for dome ID setting. The setting is strictly according to binary system. If you are not familiar with binary system please look up the address setting chart.

4. **Address setting chart**

ID	B1	B2	B3	B4	B5	B6	B7	B8
1	ON							
2		ON						
3	ON	ON						
4			ON					
5	ON		ON					
6		ON	ON					
7	ON	ON	ON					
8				ON				
9	ON			ON				
10		ON		ON				
11	ON	ON		ON				
12			ON	ON				
13	ON		ON	ON				
14		ON	ON	ON				
15	ON	ON	ON	ON				
16					ON			
17	ON				ON			
18		ON			ON			
19	ON	ON			ON			
20			ON		ON			
21	ON		ON		ON			
22		ON	ON		ON			
23	ON	ON	ON		ON			
24				ON	ON			
25	ON			ON	ON			
26		ON		ON	ON			
27	ON	ON		ON	ON			
28			ON	ON	ON			
29	ON		ON	ON	ON			
30		ON	ON	ON	ON			
31	ON	ON	ON	ON	ON			
32						ON		
33	ON					ON		
34		ON				ON		
35	ON	ON				ON		
36			ON			ON		
37	ON		ON			ON		
38		ON	ON			ON		
39	ON	ON	ON			ON		
40				ON		ON		
41	ON			ON		ON		
42		ON		ON		ON		
43	ON	ON		ON		ON		
44			ON	ON		ON		
45	ON		ON	ON		ON		
46		ON	ON	ON		ON		
47	ON	ON	ON	ON		ON		
48					ON	ON		
49	ON				ON	ON		
50		ON			ON	ON		
51	ON	ON			ON	ON		
Soft Add	ON	ON	ON	ON	ON	ON	ON	ON

ID	B1	B2	B3	B4	B5	B6	B7	B8
52			ON		ON	ON		
53	ON		ON		ON	ON		
54		ON	ON		ON	ON		
55	ON	ON	ON		ON	ON		
56				ON	ON	ON		
57	ON			ON	ON	ON		
58		ON		ON	ON	ON		
59	ON	ON		ON	ON	ON		
60			ON	ON	ON	ON		
61	ON		ON	ON	ON	ON		
62		ON	ON	ON	ON	ON		
63	ON	ON	ON	ON	ON	ON		
64							ON	
65	ON						ON	
66		ON					ON	
67	ON	ON					ON	
68			ON				ON	
69	ON		ON				ON	
70		ON	ON				ON	
71	ON	ON	ON				ON	
72				ON			ON	
73	ON			ON			ON	
74		ON		ON			ON	
75	ON	ON		ON			ON	
76			ON	ON			ON	
77	ON		ON	ON			ON	
78		ON	ON	ON			ON	
79	ON	ON	ON	ON			ON	
80					ON		ON	
81	ON				ON		ON	
82		ON			ON		ON	
83	ON	ON			ON		ON	
84			ON		ON		ON	
85	ON		ON		ON		ON	
86		ON	ON		ON		ON	
87	ON	ON	ON		ON		ON	
88				ON	ON		ON	
89	ON			ON	ON		ON	
90		ON		ON	ON		ON	
91	ON	ON		ON	ON		ON	
92			ON	ON	ON		ON	
93	ON		ON	ON	ON		ON	
94		ON	ON	ON	ON		ON	
95	ON	ON	ON	ON	ON		ON	
96						ON	ON	
97	ON					ON	ON	
98		ON				ON	ON	
99	ON	ON				ON	ON	
100			ON			ON	ON	
101	ON		ON			ON	ON	
102		ON	ON			ON	ON	
Soft Add	ON	ON	ON	ON	ON	ON	ON	ON

ID	B1	B2	B3	B4	B5	B6	B7	B8
103	ON	ON	ON			ON	ON	
104				ON		ON	ON	
105	ON			ON		ON	ON	
106		ON		ON		ON	ON	
107	ON	ON		ON		ON	ON	
108			ON	ON		ON	ON	
109	ON		ON	ON		ON	ON	
110		ON	ON	ON		ON	ON	
111	ON	ON	ON	ON		ON	ON	
112					ON	ON	ON	
113	ON				ON	ON	ON	
114		ON			ON	ON	ON	
115	ON	ON			ON	ON	ON	
116			ON		ON	ON	ON	
117	ON		ON		ON	ON	ON	
118		ON	ON		ON	ON	ON	
119	ON	ON	ON		ON	ON	ON	
120				ON	ON	ON	ON	
121	ON			ON	ON	ON	ON	
122		ON		ON	ON	ON	ON	
123	ON	ON		ON	ON	ON	ON	
124			ON	ON	ON	ON	ON	
125	ON		ON	ON	ON	ON	ON	
126		ON	ON	ON	ON	ON	ON	
127	ON	ON	ON	ON	ON	ON	ON	
128								ON
129	ON							ON
130		ON						ON
131	ON	ON						ON
132			ON					ON
133	ON		ON					ON
134		ON	ON					ON
135	ON	ON	ON					ON
136				ON				ON
137	ON			ON				ON
138		ON		ON				ON
139	ON	ON		ON				ON
140			ON	ON				ON
141	ON		ON	ON				ON
142		ON	ON	ON				ON
143	ON	ON	ON	ON				ON
144					ON			ON
145	ON				ON			ON
146		ON			ON			ON
147	ON	ON			ON			ON
148			ON		ON			ON
149	ON		ON		ON			ON
150		ON	ON		ON			ON
151	ON	ON	ON		ON			ON
152				ON	ON			ON
153	ON			ON	ON			ON
154		ON		ON	ON			ON
Soft Add	ON	ON	ON	ON	ON	ON	ON	ON

ID	B1	B2	B3	B4	B5	B6	B7	B8
155	ON	ON		ON	ON			ON
156			ON	ON	ON			ON
157	ON		ON	ON	ON			ON
158		ON	ON	ON	ON			ON
159	ON	ON	ON	ON	ON			ON
160						ON		ON
161	ON					ON		ON
162		ON				ON		ON
163	ON	ON				ON		ON
164			ON			ON		ON
165	ON		ON			ON		ON
166		ON	ON			ON		ON
167	ON	ON	ON			ON		ON
168				ON		ON		ON
169	ON			ON		ON		ON
170		ON		ON		ON		ON
171	ON	ON		ON		ON		ON
172			ON	ON		ON		ON
173	ON		ON	ON		ON		ON
174		ON	ON	ON		ON		ON
175	ON	ON	ON	ON		ON		ON
176					ON	ON		ON
177	ON				ON	ON		ON
178		ON			ON	ON		ON
179	ON	ON			ON	ON		ON
180			ON		ON	ON		ON
181	ON		ON		ON	ON		ON
182		ON	ON		ON	ON		ON
183	ON	ON	ON		ON	ON		ON
184				ON	ON	ON		ON
185	ON			ON	ON	ON		ON
186		ON		ON	ON	ON		ON
187	ON	ON		ON	ON	ON		ON
188			ON	ON	ON	ON		ON
189	ON		ON	ON	ON	ON		ON
190		ON	ON	ON	ON	ON		ON
191	ON	ON	ON	ON	ON	ON		ON
192							ON	ON
193	ON						ON	ON
194		ON					ON	ON
195	ON	ON					ON	ON
196			ON				ON	ON
197	ON		ON				ON	ON
198		ON	ON				ON	ON
199	ON	ON	ON				ON	ON
200				ON			ON	ON
201	ON			ON			ON	ON
202		ON		ON			ON	ON
203	ON	ON		ON			ON	ON
204			ON	ON			ON	ON
205	ON		ON	ON			ON	ON
206		ON	ON	ON			ON	ON
Soft Add	ON	ON	ON	ON	ON	ON	ON	ON

ID	B1	B2	B3	B4	B5	B6	B7	B8
207	ON	ON	ON	ON			ON	ON
208					ON		ON	ON
209	ON				ON		ON	ON
210		ON			ON		ON	ON
211	ON	ON			ON		ON	ON
212			ON		ON		ON	ON
213	ON		ON		ON		ON	ON
214		ON	ON		ON		ON	ON
215	ON	ON	ON		ON		ON	ON
216				ON	ON		ON	ON
217	ON			ON	ON		ON	ON
218		ON		ON	ON		ON	ON
219	ON	ON		ON	ON		ON	ON
220			ON	ON	ON		ON	ON
221	ON		ON	ON	ON		ON	ON
222		ON	ON	ON	ON		ON	ON
223	ON	ON	ON	ON	ON		ON	ON
224						ON	ON	ON
225	ON					ON	ON	ON
226		ON				ON	ON	ON
227	ON	ON				ON	ON	ON
228			ON			ON	ON	ON
229	ON		ON			ON	ON	ON
230		ON	ON			ON	ON	ON
Soft Add	ON	ON	ON	ON	ON	ON	ON	ON

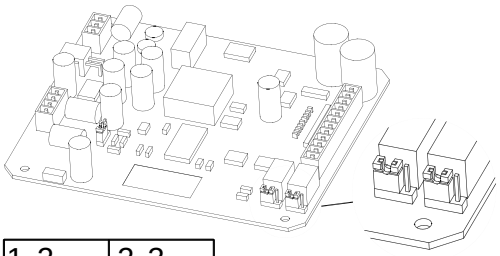
ID	B1	B2	B3	B4	B5	B6	B7	B8
231	ON	ON	ON			ON	ON	ON
232				ON		ON	ON	ON
233	ON			ON		ON	ON	ON
234		ON		ON		ON	ON	ON
235	ON	ON		ON		ON	ON	ON
236			ON	ON		ON	ON	ON
237	ON		ON	ON		ON	ON	ON
238		ON	ON	ON		ON	ON	ON
239	ON	ON	ON	ON		ON	ON	ON
240					ON	ON	ON	ON
241	ON				ON	ON	ON	ON
242		ON			ON	ON	ON	ON
243	ON	ON			ON	ON	ON	ON
244			ON		ON	ON	ON	ON
245	ON		ON		ON	ON	ON	ON
246		ON	ON		ON	ON	ON	ON
247	ON	ON	ON		ON	ON	ON	ON
248				ON	ON	ON	ON	ON
249	ON			ON	ON	ON	ON	ON
250		ON		ON	ON	ON	ON	ON
251	ON	ON		ON	ON	ON	ON	ON
252			ON	ON	ON	ON	ON	ON
253	ON		ON	ON	ON	ON	ON	ON
254		ON	ON	ON	ON	ON	ON	ON
Soft Add	ON	ON	ON	ON	ON	ON	ON	ON

◆ **Resistor jumper setting**

RS485 bus needs two 120Ω_ resistors at both ends. Set on the 120Ω¸resistors of the two devices (keyboard or dome) in the farthest distant on RS485 bus. Default setting is OFF.

When choosing the first and second pins in JP2, the 120Ω¸termination resistor is connected.

When choosing the second and third pins in JP2, the termination resistor is unconnected.

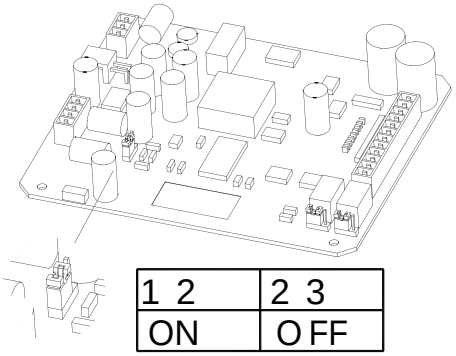


1 2	2 3
NO	NC

◆ **Alarm output method setting**

There are two alarm output methods: NO and NC. NO means normal state is open circuit, the circuit will be closed when an alarm comes in. NC means the contrary.

When choosing the first and second pins in JP4 and JP5, the alarm output state is NO. When choosing the second and third pins in JP4 and JP5, the alarm output state is NC. Factory default is NO.(refer to following picture) ”。



1 2	2 3
ON	OFF

APPENDIX II:
WIRE DIAMETER & TRANSMISSION CHART

The transmission distance listed below are farthest ones recommended for each given wire diameter when the 24V AC voltage loss ratio is below 10% (for equipment powered by AC, the allowed maximum voltage voltage loss ratio is 10%).
For example, a set of equipment with nominal power as 80VA, installed 35 feet (10m) away from transformer, needs a wire with a minimum diameter of 0.8000mm.

	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 % &

APPENDIX III: RS485 BUS BASIC KNOWLEDGE

1 Basic Property

RS485 Bus is specified by RS485 standards. It is of half-duplex data transmission cables with characteristic impedance as 120. The maximum load capacity is 32 effective loads (including main controller and controlled equipment).

2 Transmission Distance

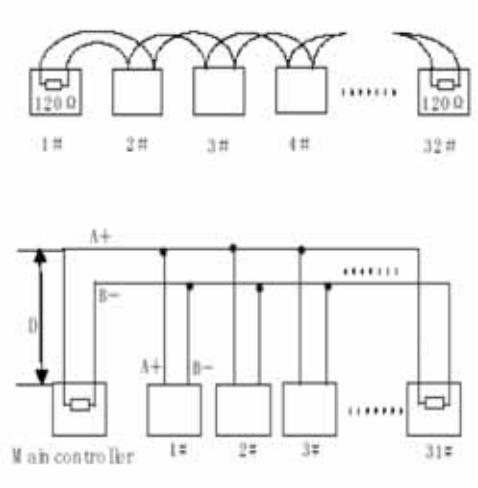
For 0.56mm (24AWG) twisted pair wires as data transmission cable, the maximum theoretical transmitting distances are as follows

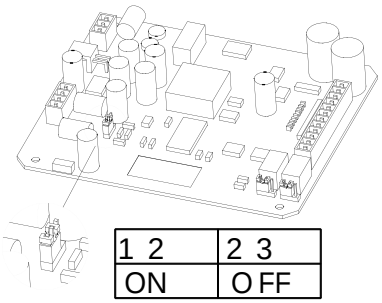
Baud Rate	Max。 Transmit Distance
2400BPS	1200m
4800BPS	1000m
9600BPS	800m

In case of thinner cables, or installs the dome in an environment with strong electromagnetic interference, or connects large number of equipment to the RS485 Bus, the maximum transmitting distance will be decreased.

3 Connection and termination resistor

3-1 The RS485 standards require daisy-chain connection between the equipment. There must be termination resistors with 120 ohm impedance at both ends of the connection (refer to following pictures). Please refer to following picture for simple connection. "D" should not exceed 7m





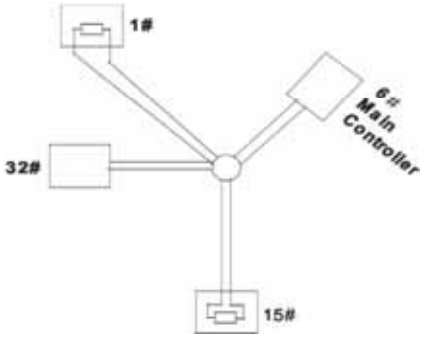
1 2	2 3
ON	OFF

4 Best Practice

In some circumstances user adopts a star configuration in practical connection. The termination resistors must be connected to the two equipment that are farthest away from each other, such as equipment 1# and 15# in the following picture.

As the star configuration is not in conformity with the requirements of RS485 standards, problems such as signal reflections, lower anti-interference performance arise when the cables are long in the connection.

The reliability of control signals is decreased with the phenomena that the dome does not respond to or just responds at intervals to the controller, or does continuous operation without stop (refer to following picture).



5 RS485

Trouble	Possible Cause	Solution
Dome can do self-testing but cannot be controlled.	1. The address and baud rate settings of dome are not in conformity with those of controller. 2. The + and - connection of RS485 Bus is incorrect. 3. Wiring is not fully seated. 4. There is breakage in the middle section of the RS485 Bus.	1. Change the address and baud rate of controller or dome. 2. Correct the connection. 3. Make sure the connections are fully seated. 。

The dome can be controlled but the operation is not smooth	**1. The RS485 Bus line is not in good contact with the connectors.** **2. One wire of the RS485 Bus is broken.** 3. The dome is very far away from controller. **4. There are too many domes connected in the system.**	**1. Secure the connection.** **2. Replace RS485 Bus wires.** **3. Add termination resistors to the system.** **4. Install RS485 distributor.**

APPENDIX IV:
TROUBLE SHOOTING

Problem	Cause	Solution
No movements, no video after power on	**Red LED on circuit board is off: The is no AC power connected to the PCB Board. There is a power outage or problem of the transformer. Camera module is not correctly connected. Output Voltage of transformer is too low. The power board is not working.**	**Check the power connection and outlet make sure they are working properly. Check power supply and transformer to see is they are working properly. Check all power related cable. Examine the power on the dome side making sure it is above 16 V.**
Self-test is ok but dome can not be controlled	**Wrong dip switch setting; Control cable reversely connected or disconnected**	**Set the dip switch correctly according to operation manual. Check the control cable, making sure it is correctly and firmly connected.**
Fan speed under 1000 rps	**Fan not firmly connected**	**Connect fan correctly. If speed is still under 1000 rpm, please contact dealer to replace the fan**
Blurred picture	**Dome in manual focus mode or bubble is stained**	**Set focus to auto mode. Clear the bubble**

APPENDIX V:
LIGHTNING PROOF & SURGE SIGNAL PROOF

The product adopts TVS lightning proof technology to prevent from damage by lightning strike below 1500 W and impulse signals such as surge.

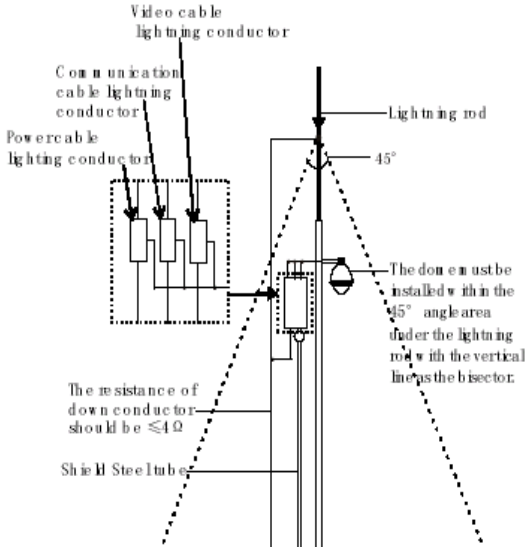
But it is also necessary to abide by the following precautions to ensure electrical safety based on practical circumstances:
Keep the communication cables at least 50 meters away from high voltage equipment or cables.

Make outdoor cable laying-out under eaves as possible as you can.
In open area shield cables in steel tube and conduct a single point ground to the tube. Trolley wire is forbidden in such circumstances.

In strong thunderstorm or high faradic zone (such as high voltage transformer substation), extra strong lightning proof equipment must be installed.

Take the building lightning proof requirements into account to design the lightning proof and grounding of outdoor equipment and cable laying-out in accordance with the national and industrial standards.

The system must be grounded with equal potentials. The earth ground connection must satisfy the anti-interference and electrical safety requirements and must not short-circuited with high voltage electricity net. When the system is grounded separately, the resistance of down conductor should be + 4 Ω and the sectional



APPENDIX VI: WARRANTY

1. Scope

The factory warrants its dome camera products to be free from defect in materials and workmanship for a period of one year from the date of purchase. During this period the factory will repair or replace components of the product which proves to be defective.

The factory warrants the repaired and replaced components for a period of 90 days from the date of dispatching repaired products. Defects of products caused by Force Majeure (such as war, earthquake, lightning strike and so on), abuse, non-standard operation, change of construction, normal wear or accident are void of warranty.

Factory assumes no risk and shall be subject to no liability for damages or loss resulting from the specific use or application made of the products. Factory's liability for any claim, whether based on breach of contract, negligence, infringement of any rights of any party or product liability, relating to the products shall not exceed the price paid by the distributor to the factory.

In no event will factory be liable for any special, incidental or consequential damages however caused, whether by the negligence of the factory or otherwise.
For defective products exceeding the warranty period, the factory assures the user a lifetime payable service

2. Products Information

Should a product require service during the warranty period, please contact the factory to request an RAN number and ship the product to factory with the following information:

Product mode and serial number; Date of purchase, purchase order number, sales confirmation number and invoice number; Detailed description of defect or malfunction.

If there is a dispute regarding the warranty of a product which does not fall under the warranty conditions stated above, please include a written explanation with the product when returned.