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# **High-Speed Positioning System Installation Manual**

**Version 1.0.5**

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## Welcome

Thank you for purchasing our high-speed positioning system!

**Please read the following safeguards and warnings carefully before you install or use the product!**

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# Important Safeguards and Warnings

## Safety Measures

### 1. Qualified Engineer Needed

- The installation engineer or maintenance engineer shall have corresponding CCTV system installation certificate or maintenance qualification certificate and corresponding working experience.
- The installation engineer or maintenance engineer shall have qualification certificate for work at height and corresponding working experience.
- The installation engineer or maintenance engineer shall have the basic knowledge and operation technique for low-voltage cable layout and low-voltage electronic cable connection.
- Please read the installation manual carefully and keep it well for future reference,
- We are not liable for any problems caused by unauthorized modifications or attempted repair.

### 2. Lifting Appliance Requirement

- Please select the proper high-speed positioning system installation mode and use the lifting appliances at the safety environment.
- The lifting appliances shall have the enough capacity to reach the installation height.
- The lifting appliances shall have safe performance.

**The precaution measures include two types: Warning and Note.**

- **Warning:** It is to alert you there is an optional risk of death or series injury!
- **Note:** It is to alert you there is an optional risk of damage or property loss!

## Warning

1. 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.
2. Be sure to use all the accessories (such as power adapter) recommended by manufacturer.
3. Do not connect several systems to one power adapter. It may result in overheat or fire if it exceeds the rated load.
4. Before you connect the cable, install or uninstall, or begin the daily maintenance work, please turn off the power and unplug the power cable.
5. Please make sure the produce is secure firmly on the wall or the ceiling.

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6. Please turn off the power and unplug the power cable, If there is any smoke, disgusting smell, or noise. Please contact your local retailer or customer service centre for help.
  7. All the examination and repair work should be done by the qualified service engineers. We are not liable for any problems caused by unauthorized modifications or attempted repair.

## **Note**

### **1. Safety Transportation**

- Heavy stress, violent vibration or water splash are not allowed during transportation, storage and installation.
- This series product must use split type package during the transportation.
- We are not liable for any damage or problem resulting from the integrated package during the transportation.

### **2. When device is malfunction**

Shut down the device and disconnect the power cable immediately if there is smoke, abnormal smell or abnormal function. Please contact your local retailer ASAP.

### **3. The laser lamp is quite dangerous; please do not look at it directly.**

### **4. Do not try to dismantle or modify the device**

- There is risk of personal injury or device damage resulting from opening the shell.
- Please contact your local retailer if there is internal setup or maintenance requirement.
- We are not liable for any problems caused by unauthorized modifications or attempted repair.

### **5. Do not allow other object falling into the device**

- Please make sure there is no metal or inflammable, explosive substance in the system.
- The above mentioned objects in the device may result in fire, short-circuit or damage.
- Please shut down the device and disconnect the power cable if there is water or liquid falling into the system. Please contact your local retailer ASAP.
- Please pay attention to the camera. Avoid the sea water or rain to erode the camera.

### **6. Handle carefully**

Do not allow this series product fall down to the ground.

Avoid heavy vibration.

It needs several people to carry the device if necessary.

### **7. Installation Environment Requirement**

- This series high-speed positioning system should be installed in a cool, dry place away from direct sunlight, inflammable, explosive substances and etc.
- This series product shall be away from the strong electromagnetism radiant, please keep it away from wireless power, TV transmitter, transformer and etc.

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- Do not install the device near the places with high heat source, such as residential heating stove, projector lamp, kitchen, boiler room and etc; otherwise, it may cause damage to the device due to high temperature. Please keep good ventilation and normal heat dissipation for installation environment and device.
  - Do not aim the PTZ lens at strong light directly, such as sun, high-power lighting equipment and etc, which may cause burn to the lens module.

## **8. Daily Maintenance**

- Please use the soft cloth to clean dust on the shell, or you can use soft cloth with cleaning liquid to clean the shell and then use soft cloth to make it dry.
- Do not use gasoline, dope thinner or other chemical material to clean the shell. It may result in shell transfiguration or paint flake.
- Do not allow the plastic or rubber material to touch the shell for a long time. It may result in paint flake.

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# 1 HIGH-SPEED POSITIONING SYSTEM INSTALLATION

## 1.1 Installation Preparation

### Basic Requirement

- All installation and operation here should conform to your local electrical safety codes. The power shall conform to the requirement in the SELV (Safety Extra Low Voltage) and the rated voltage supply should conform to Limited Power Source according to the IEC60950-1. (Power supply requirement is subject to the device label).
- Before installation, please open the package and check all the components are included. Please make sure the high-speed positioning system installation environment and installation mode can meet your requirement. If there is special requirement, please contact your local retailer for more information.
- We assume no liability or responsibility for all the fires or electrical shock caused by improper handling or installation.

### Check installation space and installation location intension

Please make sure the installation environment has enough space to install the high-speed positioning system and its corresponding bracket.

Please make sure the ceiling, wall and the bracket can support the high-speed positioning system and its corresponding installation component. It shall sustain the 8X weight of the high-speed positioning system. If it is laser PTZ, please make sure the installation height has to be more than 8m.

### About cable

Please select the cable according to your transmission distance.

The minimum video coaxial-cable requirement is:

- 75 ohm.
- Full cable with copper conductor
- 95% knitted copper shield

International Model	Max Distance (Ft\M)
RG59/U	750ft (229m)
RG6/U	1,000ft (305m)
RG11/U	1,500ft (457m)

Please refer to appendix II for RS485 communication cable.

### Select the needed power supply cable according to the transmission distance

Please refer to appendix III for 24V AC power supply device.

### Power Preparation

Please use the qualified power adapter (It is recommended to use original adapter or designated adapter), the normal service voltage is AC 24V  $\pm$  10% and the power supply power has to be



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bigger than or equal to the max power of the device. Make sure the device is in power off condition during disassembly and assembly; please do not operate with power on.

### **Please keep all package material well for future use**

Please keep high-speed positioning system package material well in case you need to send it back to your local retailer or manufacturer for maintenance work.

Non-original package material may result in device damage during the transportation.

### **Check Accessories**

When the users receive the device, first please check if there is any obvious damage to the device appearance, and if the protection material of the product package can sustain most accidental impact during the transportation. Then users have to check the accessories one by one according to the packing list, and make sure all the components listed are included.

## **1.2 Reset and SD Card Installation (Network PTZ)**

**Note:** There are two types of high speed positioning systems; the following figures are for reference only.

You can see the RESET button and Micro SD card slot after opening the protective cover of the PTZ, refer to Figure 1-1 and Figure 1-2 for more details, RESET button is used to reset the system and the Micro SD card slot is used to store data.

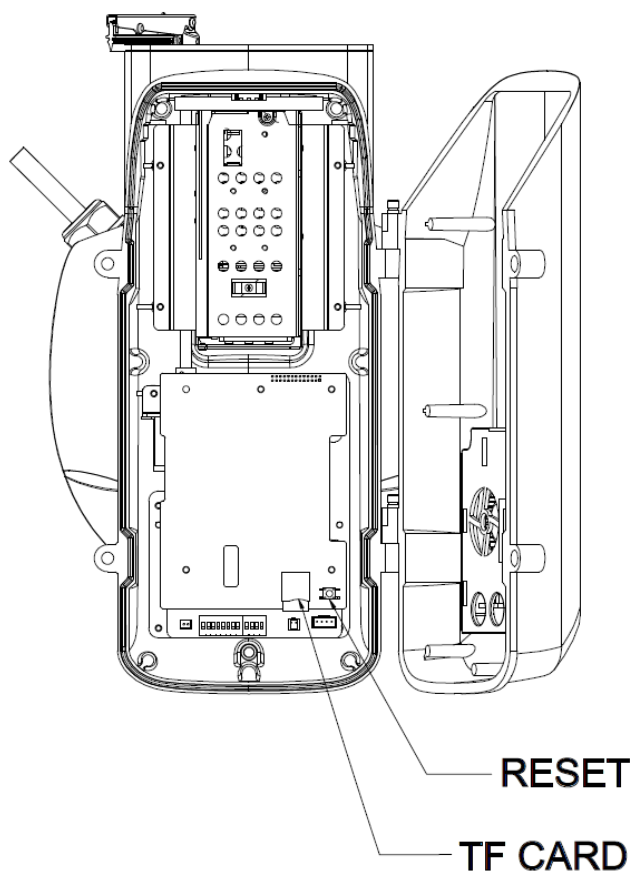


Figure 1-1

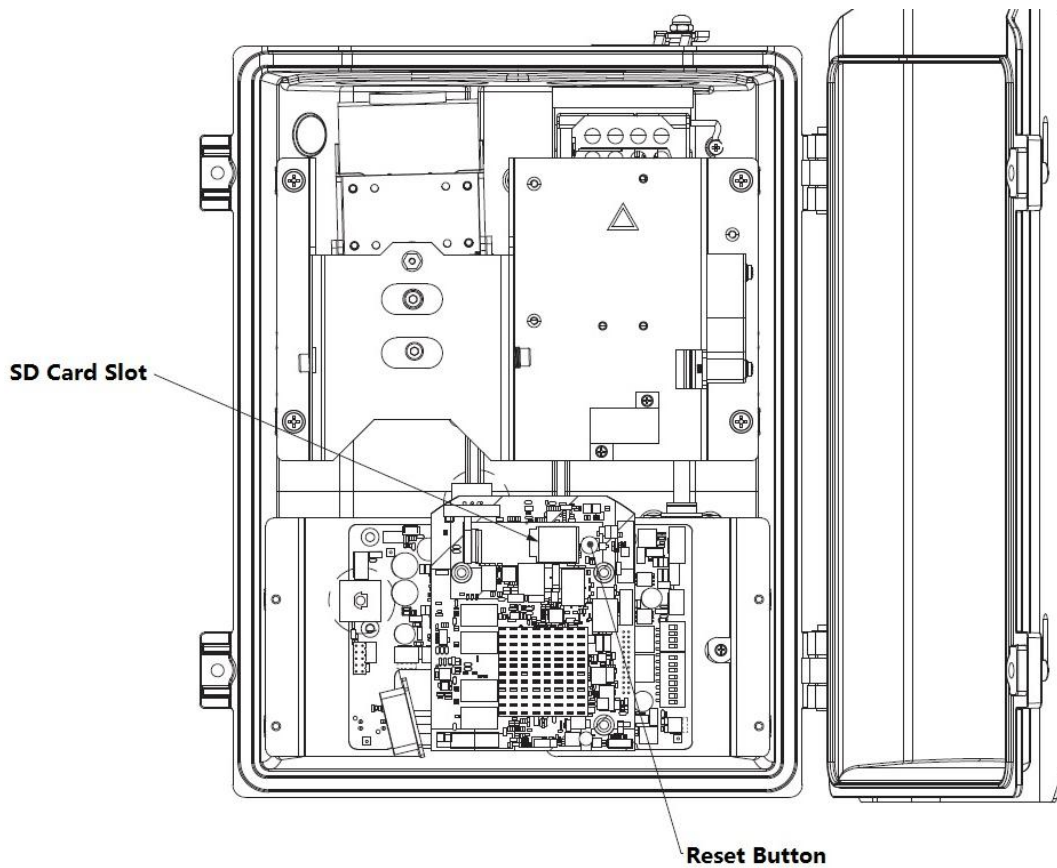


Figure 1-2

Attention:

It needs professional technician to install SD card, the users have to be liable for the device malfunction during removal process.

### 1.3 Sun Shield Installation

**Note:** The chapter can be applied to IR PTZ Network camera.

Take out the PTZ, sun shield from the packing box; take out 2 M6X14 screws from the accessories bag, then use screws to secure the sun shield and PTZ housing firmly, pay attention to the shield location during installation, see Figure 1-3 for more details.

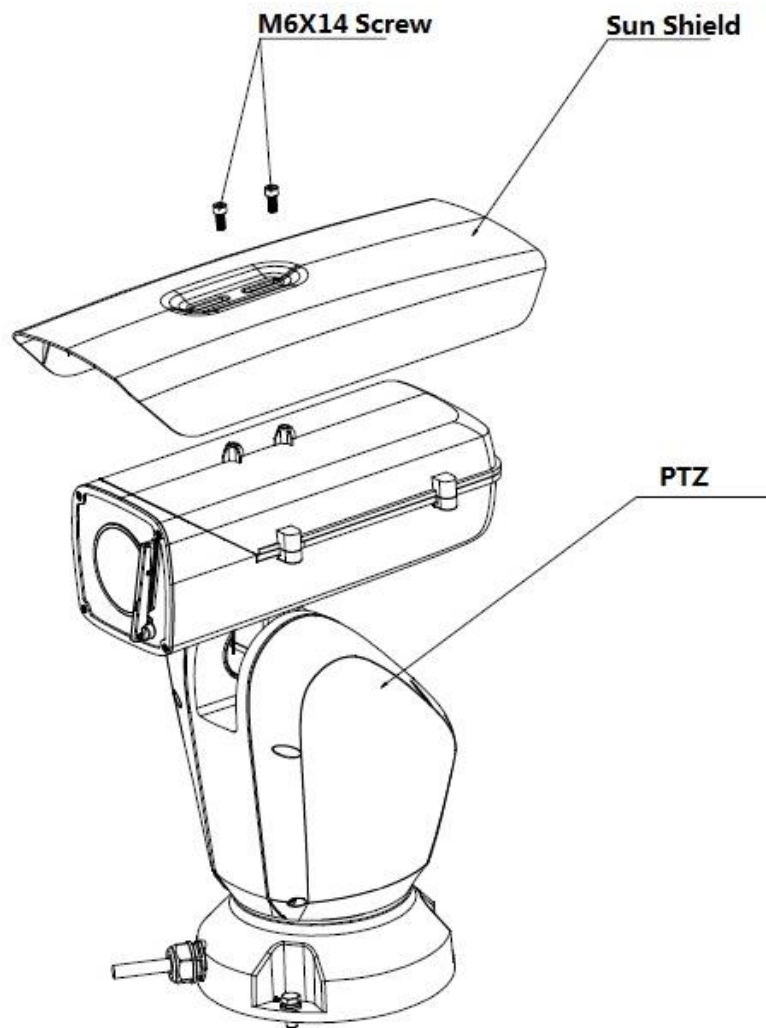


Figure 1-3

Note:

See Figure 1-4 for the details of screw locking position.

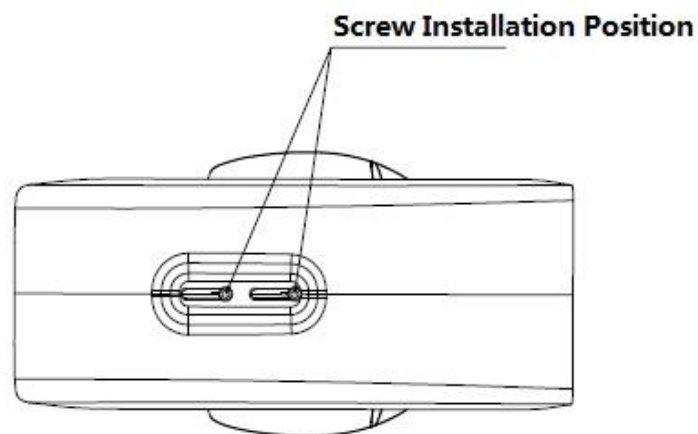


Figure 1-4

## 1.4 PTZ Pole Mount

PTZ has several brackets to meet various installation requirements. Please refer to the following contents to install the PTZ. Now we are going to install pole mount PTZ.

### 1.4.1 Installation Environment

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Pole mount PTZ can be used for indoor/outdoor pole bracket structure.  
The holes of the pole mount bracket can work with the holes of the PTZ pedestal.  
The pole mount bracket can min sustain 4X weight of the PTZ.  
Make sure the pole mount bracket is stable; it is not allowed to install in a shaky environment.

### 1.4.2 PTZ Side Cable Exit Installation

Step 1 Drill holes in advance

Drill  $\Phi 12$  holes in advance on the cement ground according to the chassis size in Figure 2-2, then insert M8 expansion bolts into the holes, see Figure 1-5.

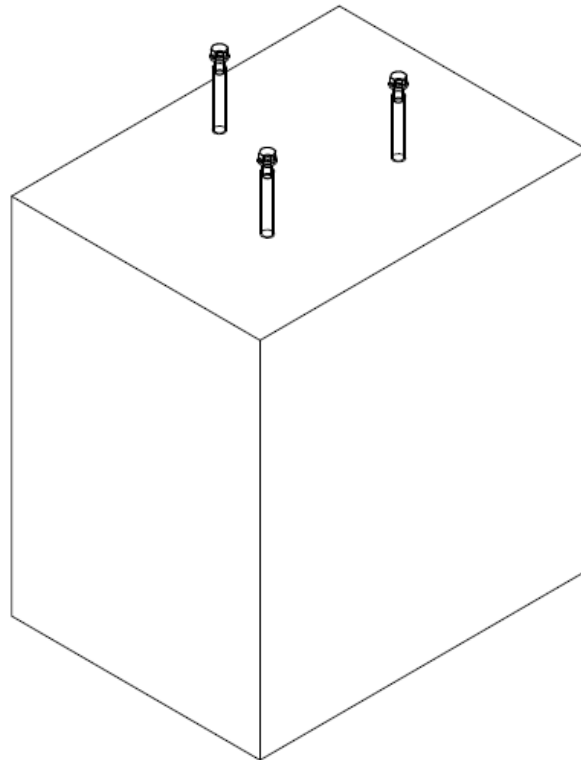


Figure 1-5

Step 2 Install Fastening PTZ

Put the PTZ into the holes drilled in advance, secure the bolts and make sure it doesn't shake.  
See Figure 1-6 for more details.

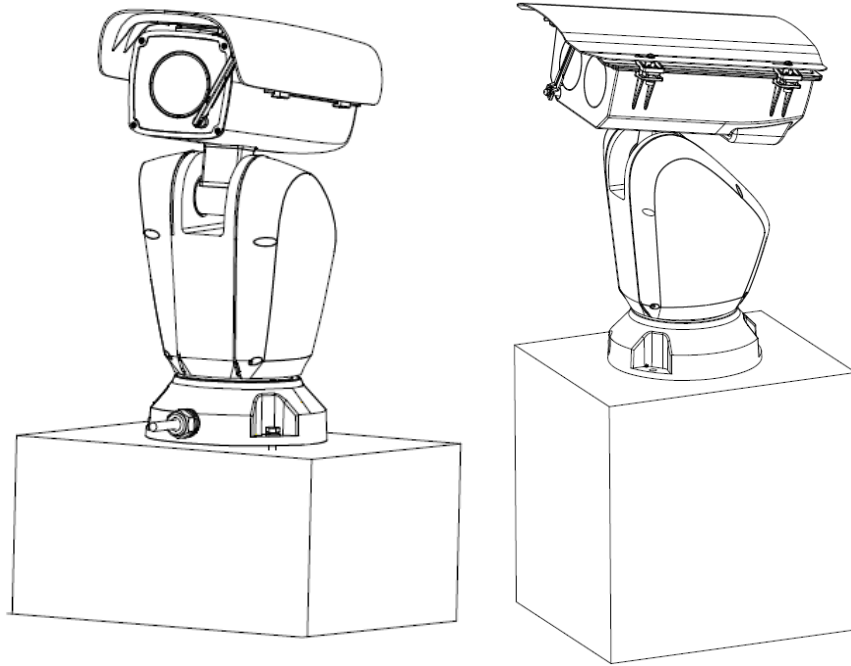


Figure 1-6

### Step 3 Cable Connection

Please connect the combination cables of the intelligent PTZ to corresponding power, video output, audio cable, RS-485 control cable, alarm input/output port, network cable, high-frequency cable, optical fiber cable and etc (according to the actual needs), then use insulated tape to secure the connection joint to make the device waterproof. See Figure 1-7 for more details.

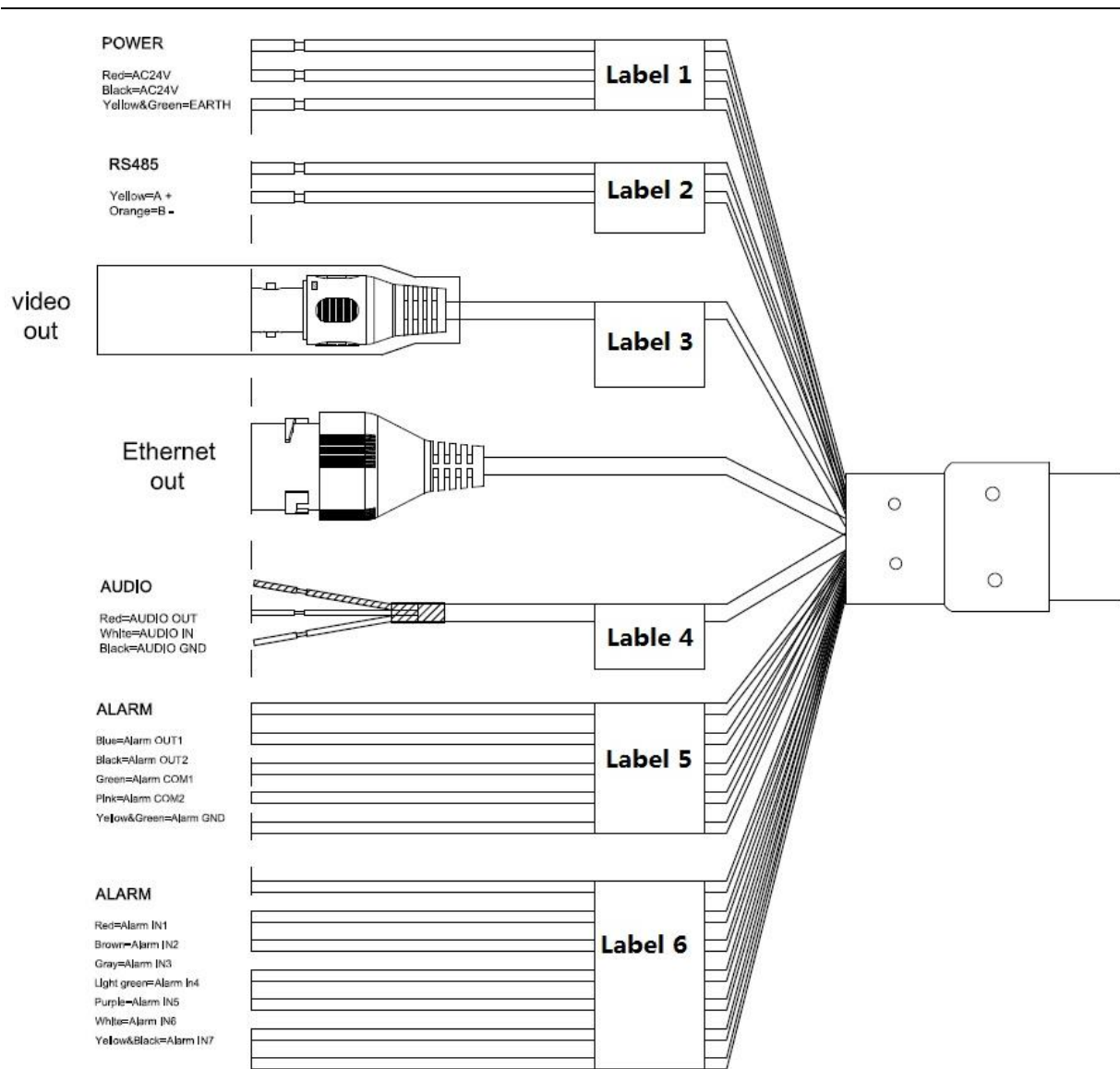


Figure 1-7

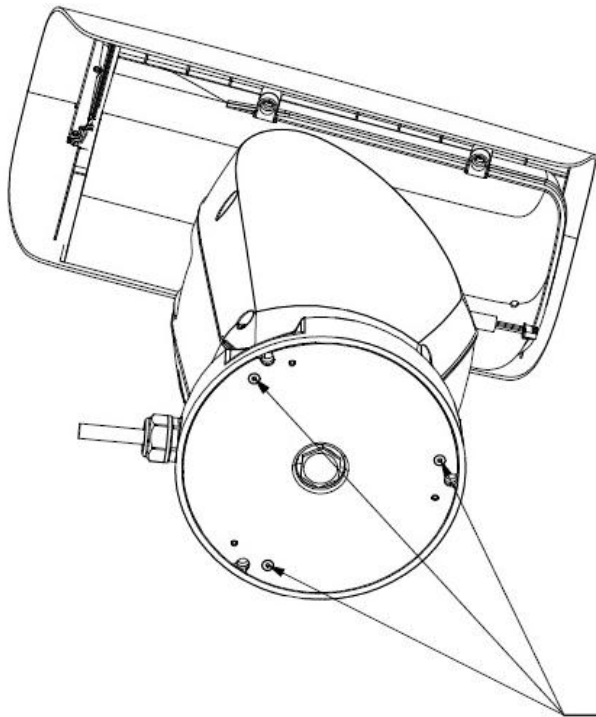
**Note:**

The video port is covered the heat shrink tube of high shrinking ratio. After the video connection, please heat the tube to make sure the video port is damp proof and water proof.

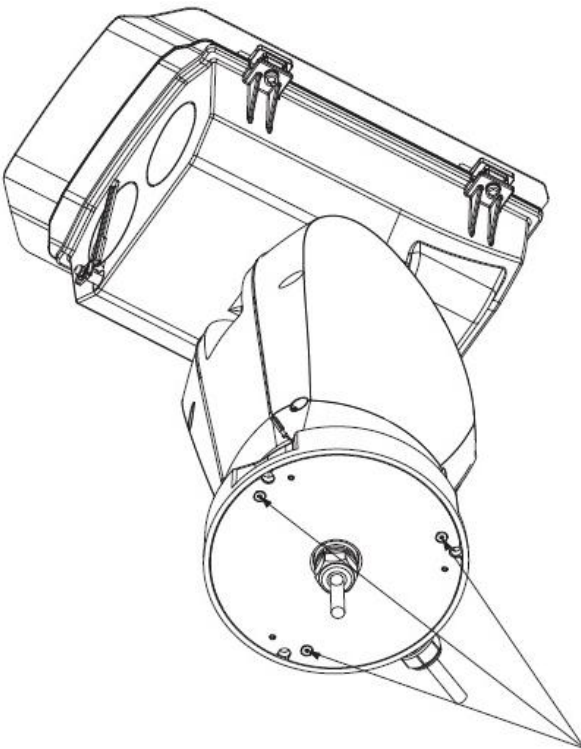
**1.4.3 PTZ Bottom Cable Exit Installation**

Step 1 Change the location of cable exit.

1. Use inner hex wrench to unscrew 3 screws on the bottom, see Figure 1-8 for details.



**Unscrew 3 M4 Countersunk Head Screws**



**Unscrew 3 M4 Countersunk Head Screws**

Figure 1-8

2. Pull out the white plug of combination cable, and loosen the connectors of combination cable and bottom cover respectively, then make the switch of cable exit from side to bottom. See Figure 1-9 for more details.

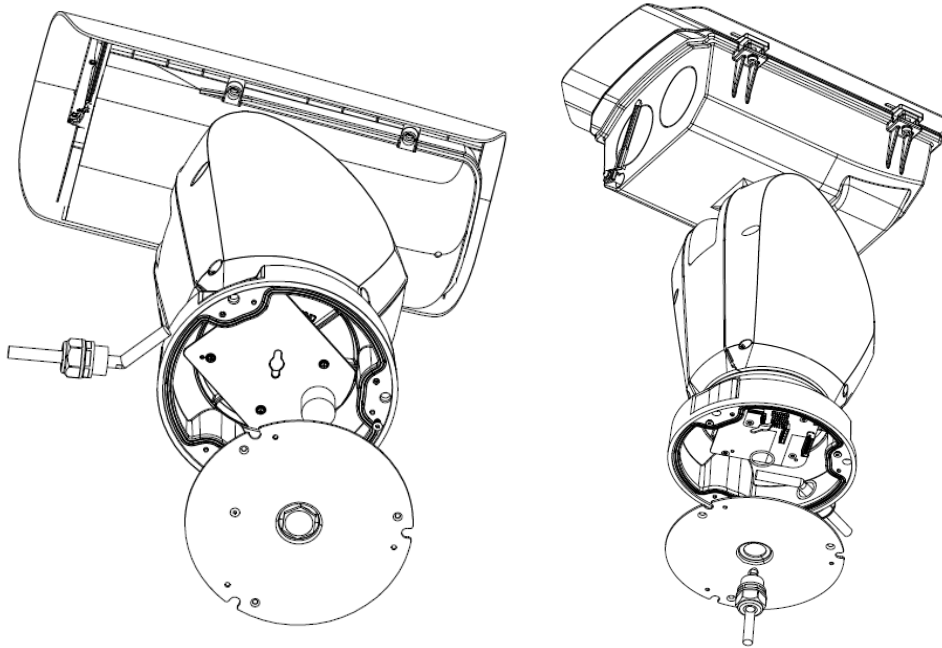


Figure 1-9

3. Plug back the white plug of combination cable, screw back the screws and cover, ensure the screws are fixed firmly, pay attention to the location of the seal ring and make it sealed properly.

#### Step 2 Connect PTZ and bracket

Pull the cable through pole mount bracket, line up the screws of the PTZ pedestal to the holes of the pole mount bracket. Use screws to fix the PTZ firmly. See Figure 1-10 for details.

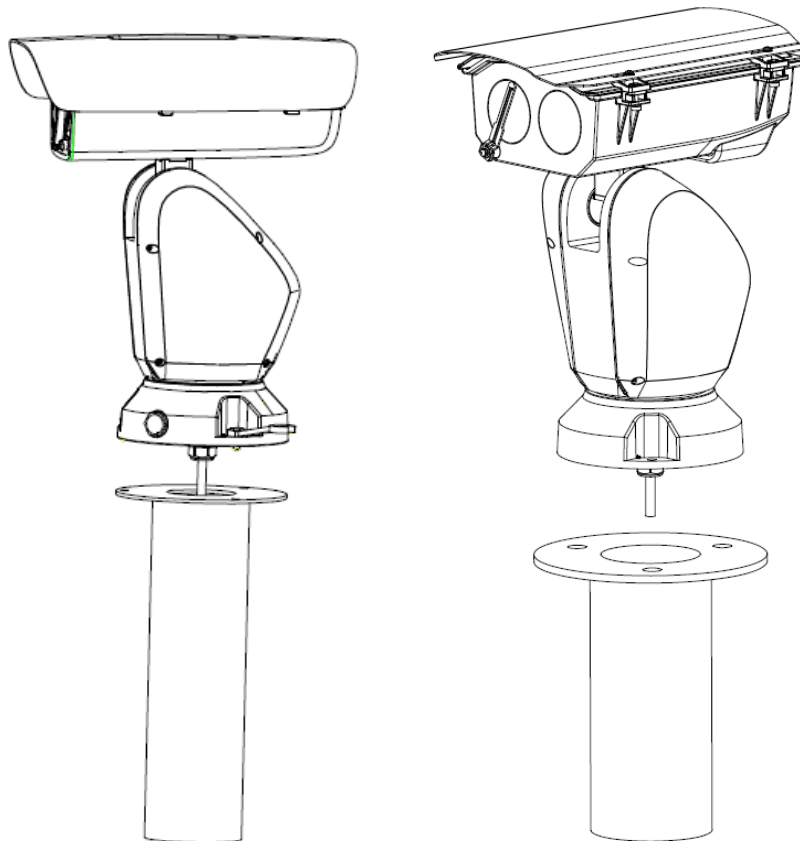


Figure 1-10



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### Step 3 Cable Connection

Please connect the combination cables of the intelligent PTZ to corresponding power, video output, audio cable, RS-485 control cable, alarm input/output port, network cable, high-frequency cable, optical fiber cable and etc (according to the actual needs), then use insulated tape to secure the connection joint to make the device waterproof. See Figure 1-11 for more details.

Note:

The video port is covered the heat shrink tube of high shrinking ratio. After the video connection, please heat the tube to make sure the video port is damp proof and water proof.

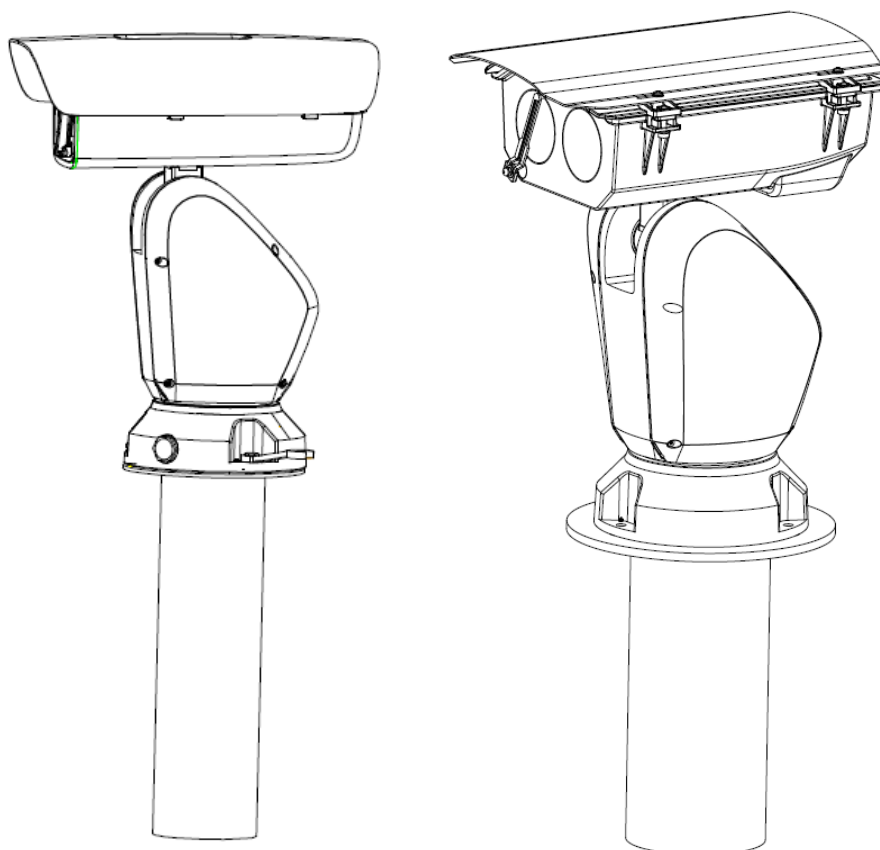


Figure 1-11

## 1.5 PTZ Wall Mount

### 1.5.1 Installation Conditions

Wall mount PTZ can be applied in indoor/outdoor hard wall structure:

- The wall is thick enough to install expansion bolt.
- The wall can min sustain 4x weight of the PTZ.

### 1.5.2 Dig Installation Hole

Take the installation hole of wall mount bracket undersurface as template, draw the position of installation holes on the wall in advance and dig installation holes; then insert the expansion bolt into the holes you just dug (expansion bolt is not included in the accessories bag).

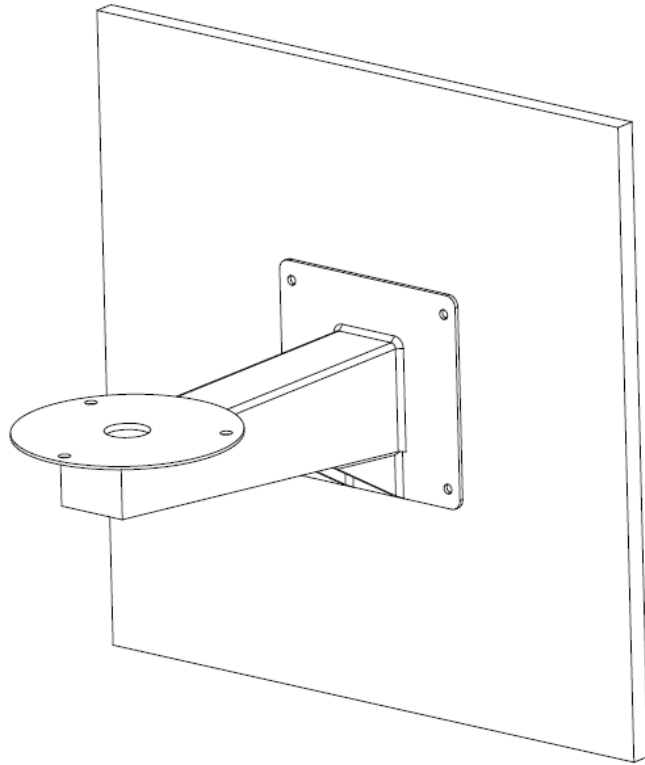


Figure 1-12

### 1.5.3 PTZ Installation

#### Step 1

Connect the PTZ to the bracket.

First use the quick installation screws on the PTZ to fix the PTZ on the bracket, then tighten the PTZ via hex head screws, see Figure 1-13 for more details.

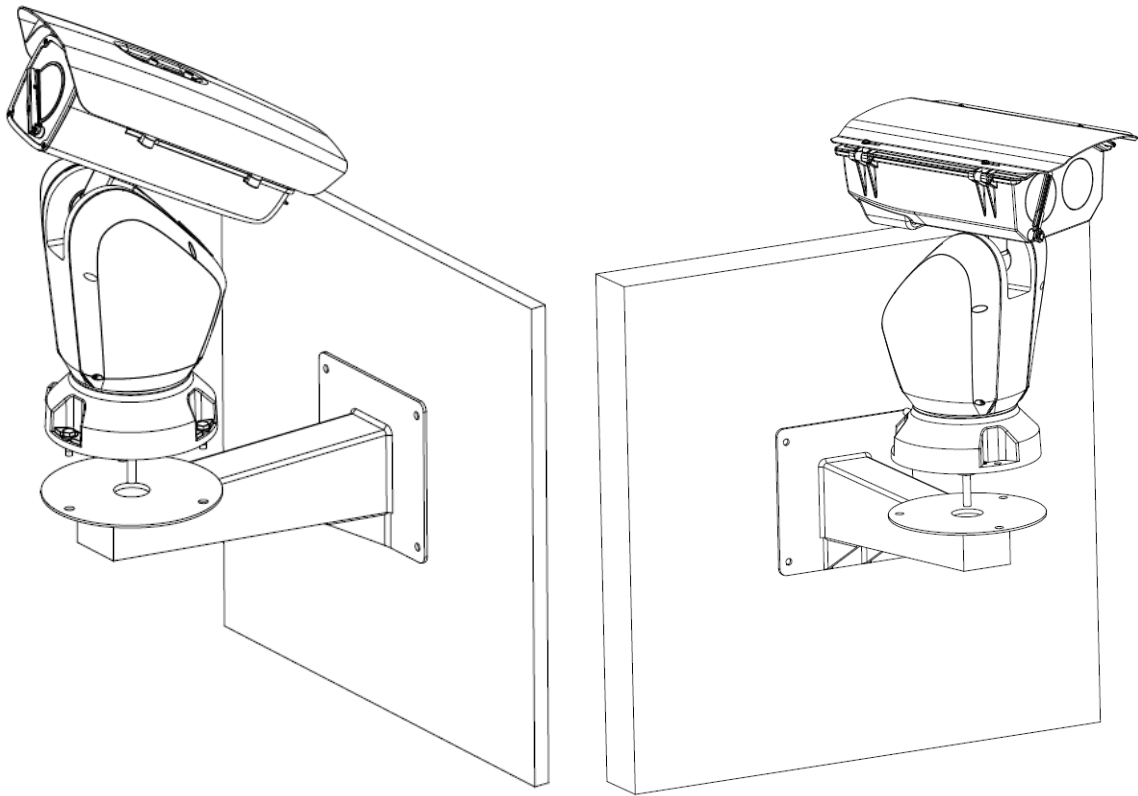


Figure 1-13

Step 2  
Cable connection.

Step 3  
Fix the bracket. Fix the PTZ together with bracket on the wall, see Figure 1-14 for more details.

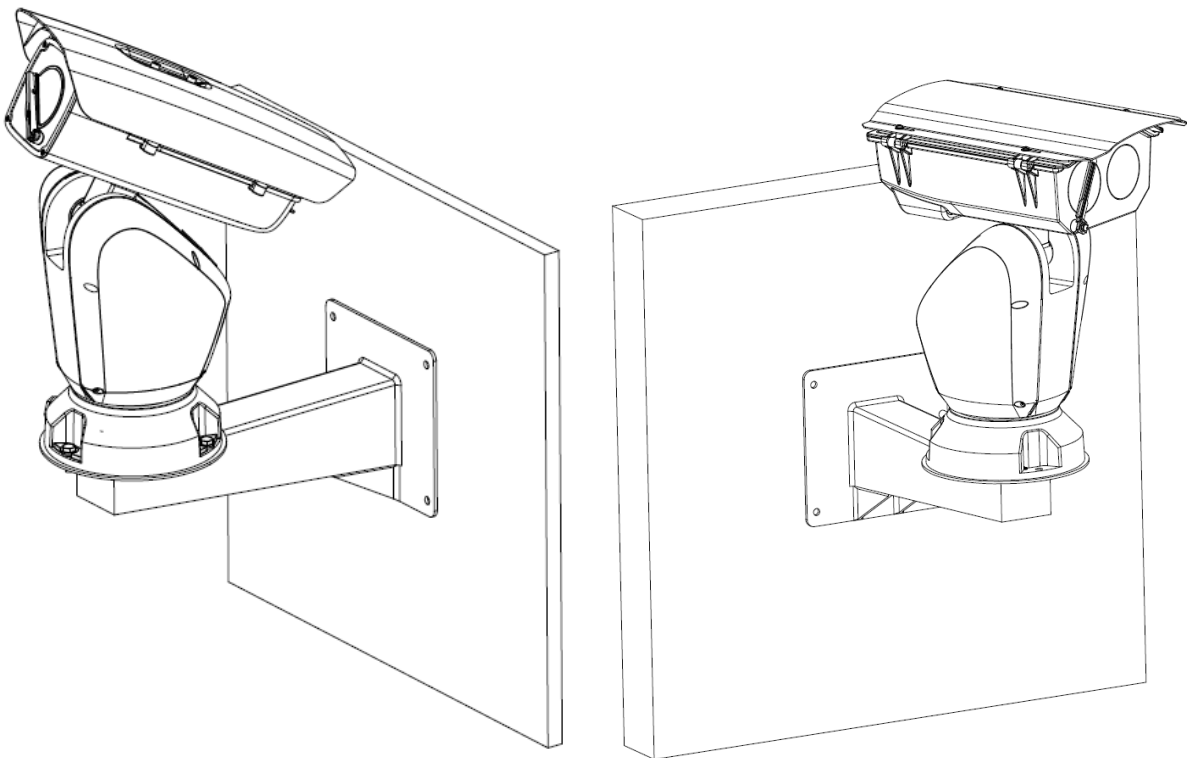


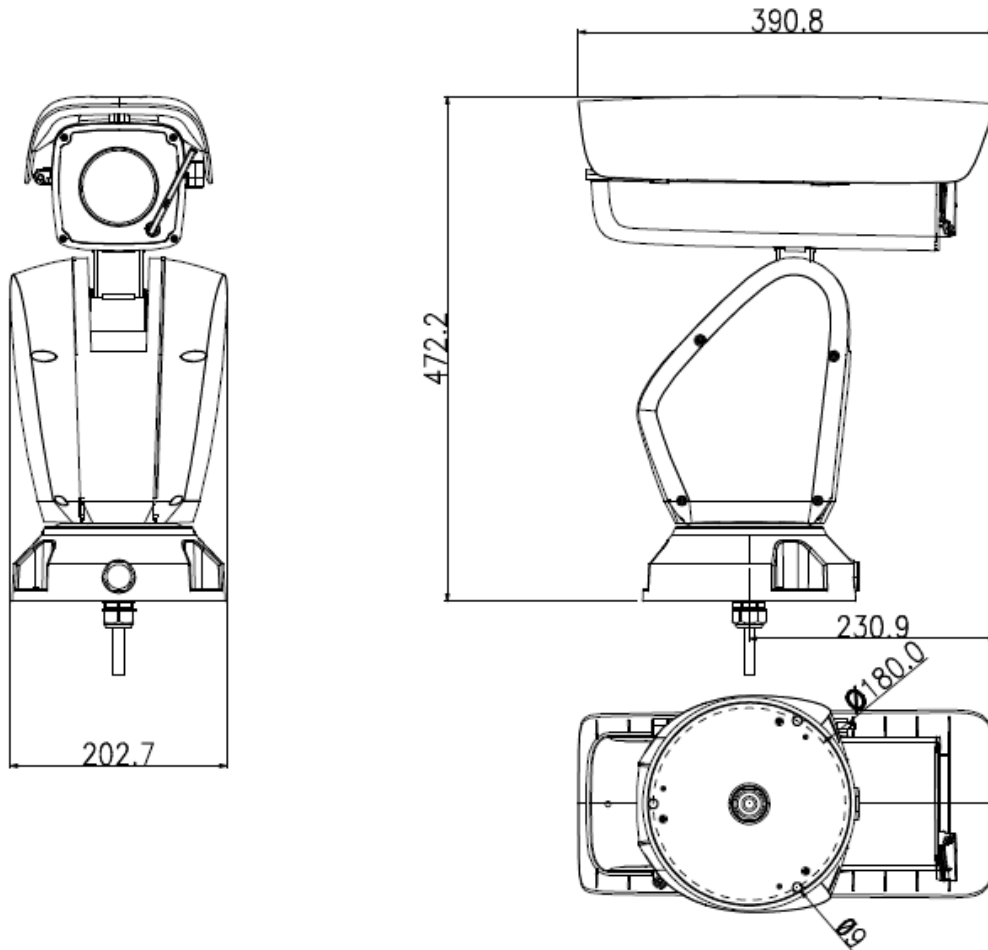
Figure 1-14

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## 2 BRACKET DIMENSIONS

### 2.1 PTZ Pedestal

The bracket dimensions are shown as below. See Figure 2-1.



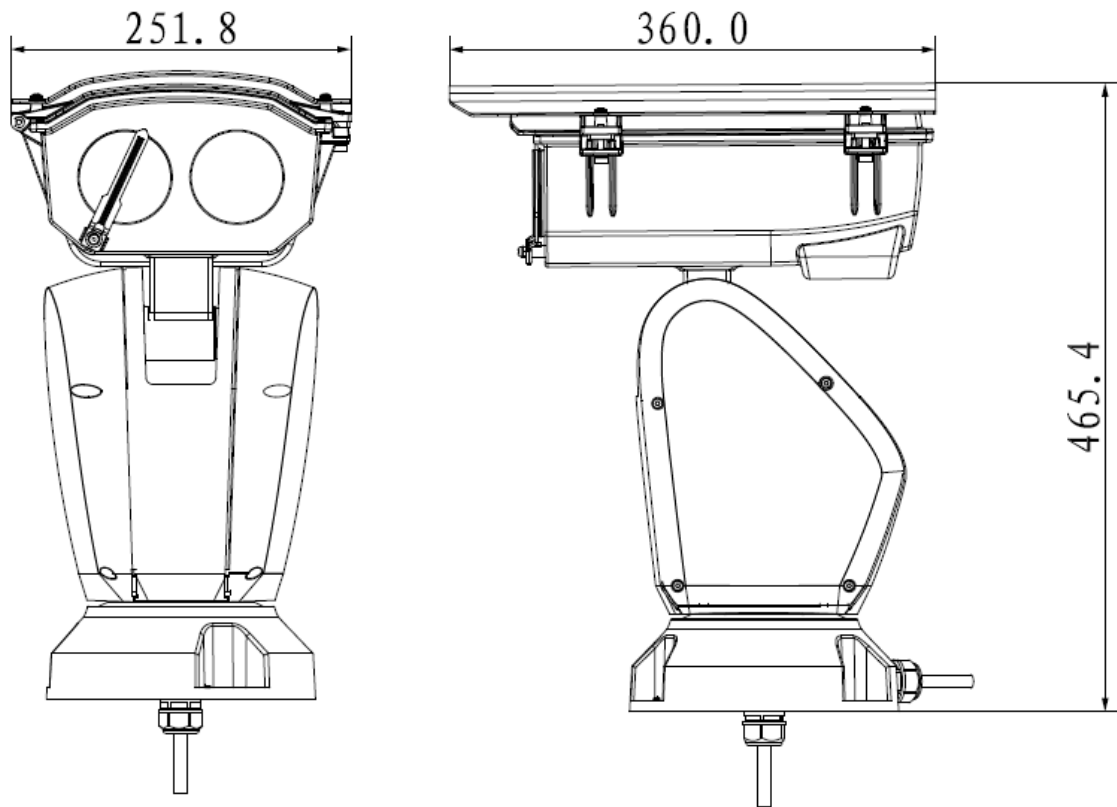


Figure 2-1

## 2.2 Pole Mount Pedestal

The pole mount pedestal is shown as below. See Figure 2-2.

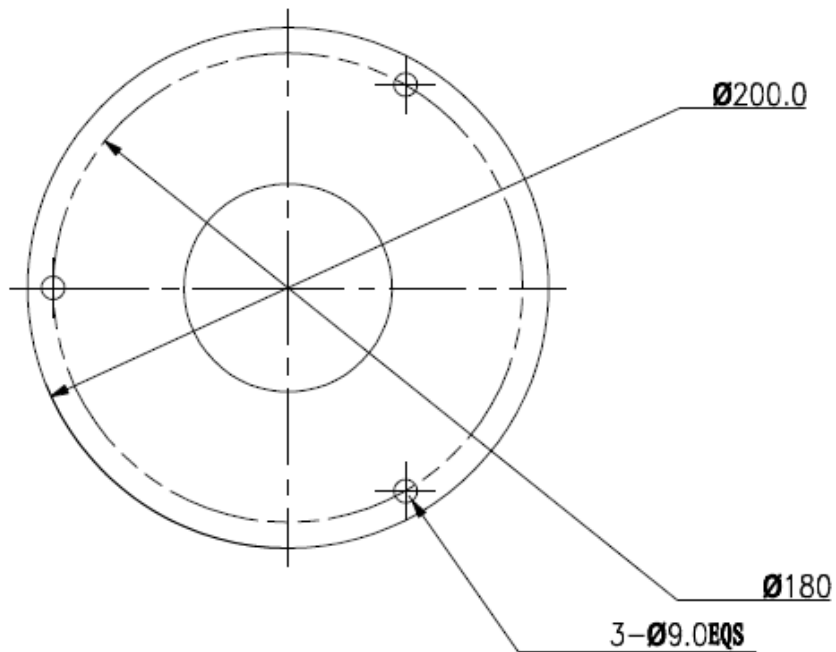


Figure 2-2

## 2.3 Wall Mount Bracket

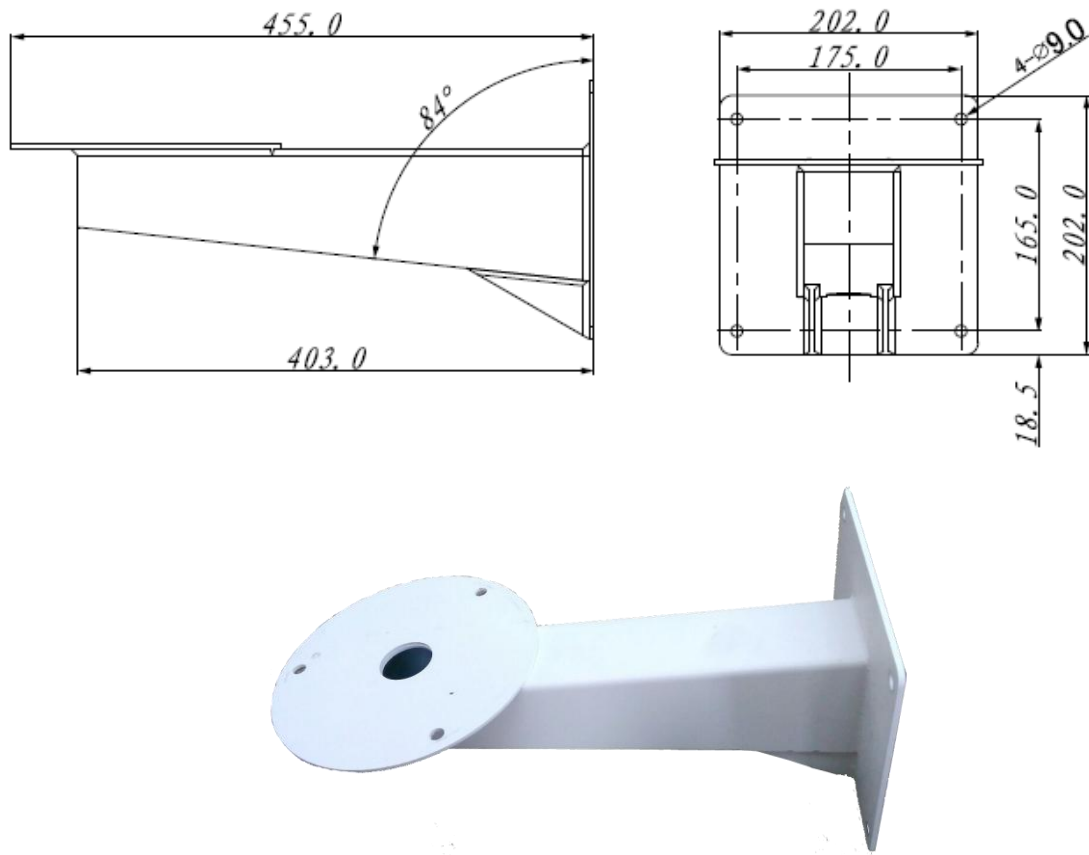


Figure 2-3

### 3 APPENDIX I LIGHTNING PROOF AND SURGE PROTECTION

This series high-speed positioning system adopts TVS lightning protection technology. It can effectively prevent damages from various pulse signals below 1500W, such as sudden lightning and surge. While maintaining your local electrical safety code, you still need to take necessary precaution measures when installing the high-speed positioning system 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 3-1.

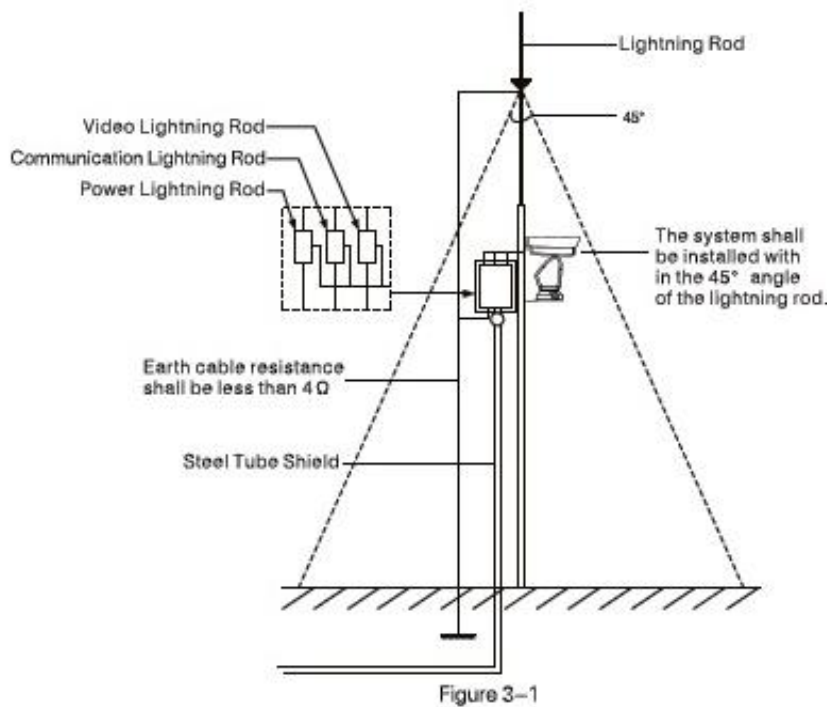


Figure 3-1

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## 4 APPENDIX II ABOUT RS485 BUS

### 4.1 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).

### 4.2 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.

### 4.3 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 4-1 ). 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 high-speed positioning system is not under control or high-speed positioning system is running automatically and can not stop.

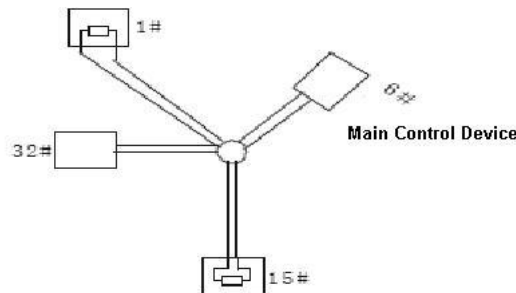


Figure 4-1

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 4-2.



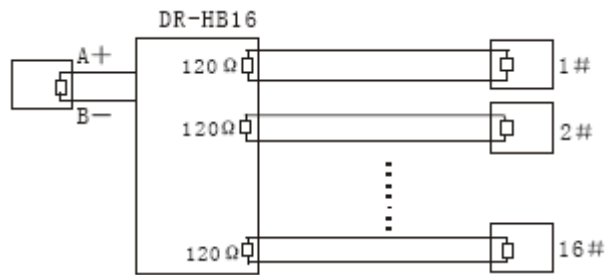


Figure 4-2

#### 4.4 RS485 Bus FAQ

Phenomenon	Possible Reasons	Solution
High-Speed positioning system can run self-diagnosis but I can not control it.	<ul style="list-style-type: none"> <li>● Host address(baud rate) and high-speed positioning system 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 high-speed positioning system 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 high-speed positioning system, 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 high-speed positioning system is too far;</li> <li>● Parallel connected too much system.</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>

## 5 APPENDIX III THE RELATIONSHIP BETWEEN THE 24V AC CABLE DIAMETER AND THE TRANSMISSION DISTANCE

It is the recommended transmission distance when the cable diameter is fixed and the 24V AC power consumption is below 10%. For the AC device, the max permission voltage power consumption is 10%. For example, when a device of rated power 90VA installed from the transformer 27 inches (8m), then the min cable diameter is 0.8000mm.

mm Feet (m) W	0.8000	1.000	1.250	2.000
5	489 (149)	763 (233)	1193 (364)	3053 (931)
10	244 (74)	382 (116)	596 (182)	1527 (465)
15	163 (50)	254 (78)	398 (121)	1018 (310)
20	122 (37)	191 (58)	298 (91)	763 (233)
25	98 (30)	153 (47)	239 (73)	611 (186)
30	81 (25)	127 (39)	199 (61)	509 (155)
35	70 (21)	109 (33)	170 (52)	436 (133)
40	61 (19)	95 (29)	149 (45)	382 (116)
45	54 (17)	85 (26)	133 (40)	339 (103)
50	49 (15)	76 (23)	119 (36)	305 (93)
55	44 (14)	69 (21)	108 (33)	278 (85)
60	41 (12)	64 (19)	99 (30)	254 (78)
65	38 (11)	59 (18)	92 (28)	235 (72)
70	35 (11)	55 (17)	85 (26)	218 (66)
75	33 (10)	51 (16)	80 (24)	204 (62)
80	31 (9)	48 (15)	75 (23)	191 (58)
85	29 (9)	45 (14)	70 (21)	180 (55)
90	27 (8)	42 (13)	66 (20)	170 (52)
95	26 (8)	40 (12)	63 (19)	161 (49)
100	24 (7)	38 (12)	60 (18)	153 (47)

## 6 APPENDIX IV WIRE GAUGE REFERENCE SHEET

Metric bare wire diameter (mm)	AWG	SWG	Bare wire cross section (mm <sup>2</sup> )
0.050	43	47	0.00196
0.060	42	46	0.00283
0.070	41	45	0.00385
0.080	40	44	0.00503
0.090	39	43	0.00636
0.100	38	42	0.00785
0.110	37	41	0.00950
0.130	36	39	0.01327
0.140	35		0.01539
0.160	34	37	0.02011
0.180	33		0.02545
0.200	32	35	0.03142
0.230	31		0.04115
0.250	30	33	0.04909
0.290	29	31	0.06605
0.330	28	30	0.08553
0.350	27	29	0.09621
0.400	26	28	0.1257
0.450	25		0.1602
0.560	24	24	0.2463
0.600	23	23	0.2827
0.710	22	22	0.3958
0.750	21		0.4417
0.800	20	21	0.5027
0.900	19	20	0.6362
1.000	18	19	0.7854
1.250	16	18	1.2266
1.500	15		1.7663
2.000	12	14	3.1420
2.500			4.9080
3.000			7.0683

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**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.**