IR Intelligent Speed Dome Installation Manual

Version 1.1.5

Table of Contents

Welcome

Thank you for purchasing our speed dome!

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

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.
- The installation engineer or maintenance engineer shall have qualification certificate for work at height.
- 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 speed dome 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. The power shall conform to the requirement in the SELV (Safety Extra Low Voltage) and the rated voltage conformed to Limited Power Source according to the IEC60950-1. (Power supply requirement is subject to the device label).
2. We assume no liability or responsibility for all the fires or electrical shock caused by improper handling or installation.
3. Be sure to use all the accessories (such as power adapter) recommended by manufacturer.
4. Do not connect several speed domes to one power adapter. It may result in overheat or fire if it exceeds the rated load.
5. Before you connect the cable, install or uninstall, or begin the daily maintenance work, please turn off the power and unplug the power cable.

6. Please make sure the produce is secure firmly on the wall or the ceiling.
7. 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 center for help.
8. 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. 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.

4. Do not allow other object falling into the device

- Please make sure there is no metal or inflammable, explosive substance in the speed dome.
- 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 camera. Please contact your local retailer ASAP.
- Please pay attention to the camera. Avoid the sea water or rain to erode the camera.

5. Handle carefully

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

6. Installation Environment Requirement

- This series speed dome 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.

7. 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.

1 INSTALLATION PREPARATION

1.1 Basic Requirements

- All installation and operation here should conform to your local electrical safety codes, fire prevention laws and some related regulations.
- Make sure if the application scene of the speed dome conforms to the installation requirements. Please contact your dealer if you have any questions.
- Please use the product according to the operating environment.
- Please keep the original packing material well after opening the package; you can use original packing material to pack the speed dome and send it back for maintenance in case problems occur.

1.2 Installation Check

- Make sure the installation site has enough space to hold the product and its mounting components.
- Please make sure the ceiling or wall can sustain 8X weight of the speed dome and its mounting components.
- Please make sure the wall is thick enough to install expansion bolts (Users need to purchase separately).
- It needs to guarantee the installation height shall be more than 6m if it is the intelligent tracking speed dome or laser speed dome.

1.3 Cable Preparation

Please select video cable and lowest specification requirement of video coaxial cable according to the transmission distance.

1.3.1 Cable Lowest Specification Requirement

- 75 ohm.
- Full cable with copper conductor.
- 95% knitted copper shield.
- Please refer to appendix II for RS485.

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

Note

The above can be applied to analog speed dome and network speed dome.

International Model	Max Transmission Distance (M\Ft)
SYV-75-3	720P(25fps\30fps)：500M/1640Ft
	720P(50fps\60fps)：300M/984Ft
	1080P(25fps\30fps): 300M/984Ft

Note

The above can be applied to HDAVS speed dome.

1.3.2 Select Needed Power Supply Cable According to Transmission Distance

Refer to appendix II for AC 24V power supply device.

Refer to appendix III for DC 12V power supply device.

2 Speed Dome Installation

2.1 Check Device

First please check if the device is in a good condition in the packing box before installation, and all the components are complete (refer to packing list for more details).

2.2 Open Device

Open the box, take out the device and remove adhesive tape covered on the dome body, which is shown in Figure 2-1.

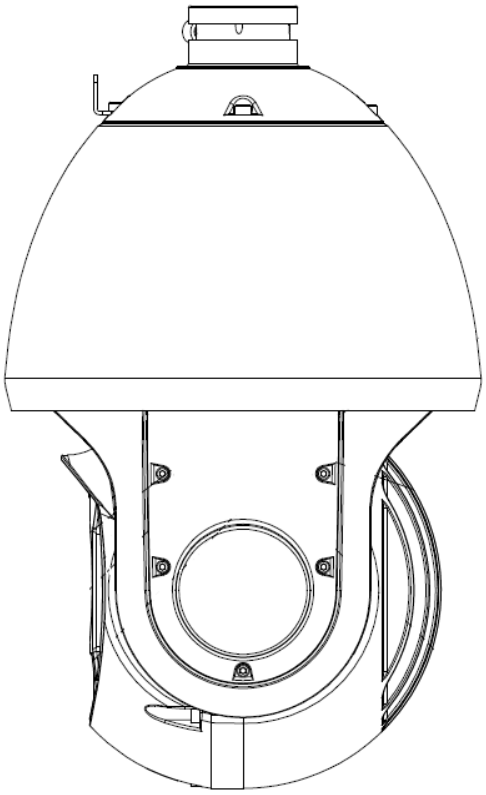

Figure 2-1

2.3 DIP Switch Setup

2.3.1 DIP Switch Location

The corresponding functions between analog speed dome and HDAVS speed dome are different, which will be separately introduced below.

2.3.1.1 Analog Speed Dome

There are two DIP switches on the PCB board of the speed dome side (attached with DIP label), which are used to set speed dome address, baud rate and parity. The location of DIP switch is shown in Figure 2-2.

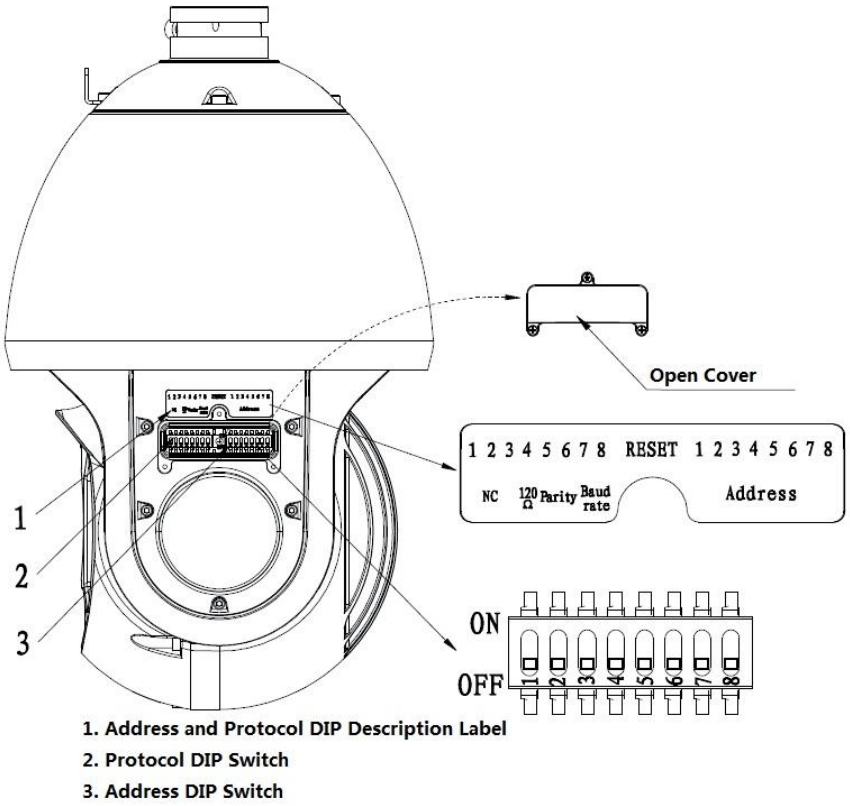

Figure 2-2

2.3.1.2 HDAVS Speed Dome

There are two DIP switches on the PCB board of the speed dome side (attached with DIP label), which are used to set speed dome address and parity. The location of DIP switch is shown in Figure 2-3.

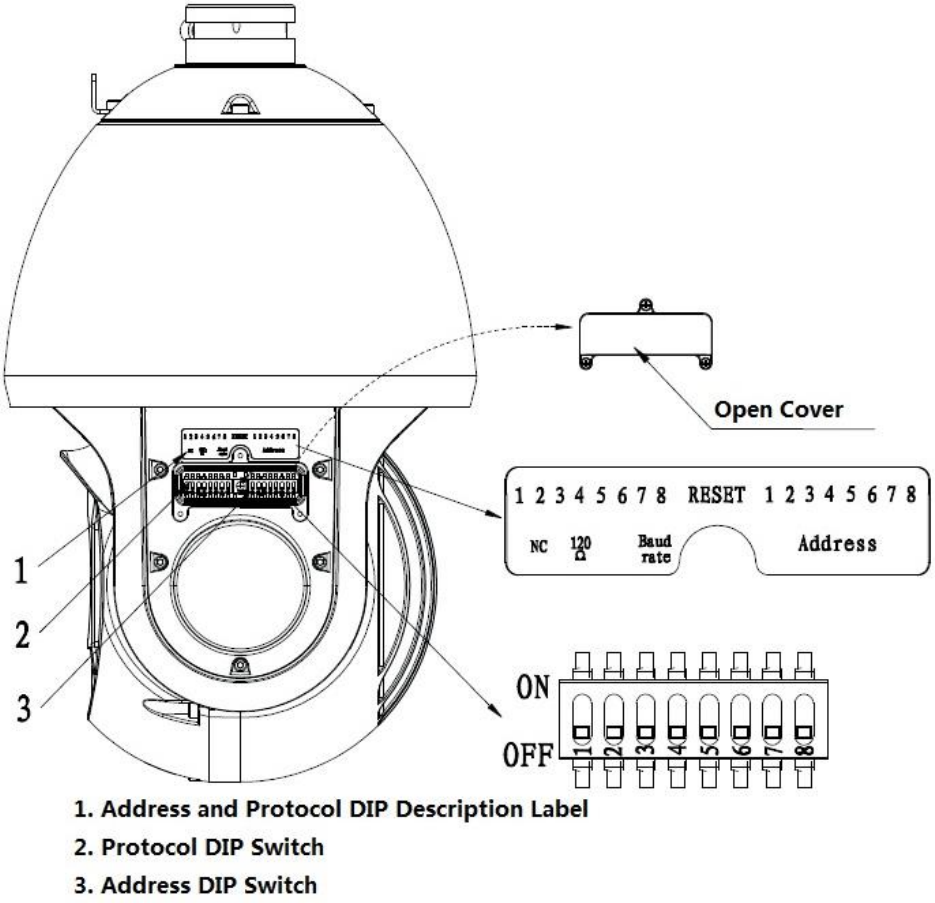

Figure 2-3

2.3.2 DIP Switch Setup

It needs to set the address number and baud rate before controlling the speed dome.

Note

After some related information has been reset, it has to cut off the power and reboot the device to make the new settings valid.

There are two DIP switches on the PCB board of the speed dome side, which are used to confirm the speed dome address, baud rate and parity parameters.

For the protocol DIP switch, 1~3 is NC neutral bit, 4 is the setting bit for 120Ω matched resistance, ON is to connect 120Ω matched resistance, 5, 6 are the setting bit for parity, 7, 8 are the setting bit for baud rate. Among the DIP switch numbers, 1 is the lowest bit while 8 is the highest bit.

Note

The intelligent speed dome can self-adapt to PELCO-D, PELCO-P and industrial standard protocol, control protocol doesn't need to be set via DIP switch.

2.3.3 Address Setup

The speed dome can use DIP switch to set address number, coding mode adopts binary coding. 1~8 bits are valid bit, the highest address bit is 255, the address label is shown in Figure 2-4, please refer to Table 2-1 for the address bit setup.

1	2	3	4	5	6	7	8
Address							

Figure 2-4

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

Table 2-1

2.3.4 Baud Rate and Parity Setup

The functions which need to be set between analog speed dome and HDAVS speed dome, which will be introduced separately.

2.3.4.1 Analog Speed Dome

It is to set parity and baud rate of the speed dome. 5 and 6 bit is the setting bit of parity while 7 and 8 are the setting bit of baud rate, the label is shown in Figure 2-5, please refer to Table 2-2 and Table 2-3 for the setting.

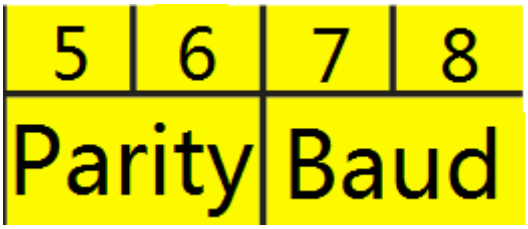

Figure 2-5

5	6	Parity
OFF	OFF	NONE
ON	OFF	EVEN
OFF	ON	ODD
ON	ON	NONE

Table 2-2

7	8	Baud Rate
OFF	OFF	9600bps
ON	OFF	4800bps
OFF	ON	2400bps
ON	ON	1200bps

Table 2-3

2.3.4.2 HDAVS Speed Dome

It is to set baud rate. 7 and 8 bit is the setting bit of baud rate. The label is shown in Figure 2-6; please refer to Table 2-4 for the setting.

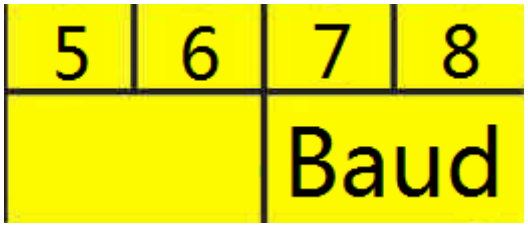

Figure 2-6

7	8	Baud Rate
OFF	OFF	9600bps
ON	OFF	4800bps
OFF	ON	2400bps
ON	ON	1200bps

Table 2-4

2.3.5 Terminal Matched Resistance Setup

There are two connection modes of device terminal 120Ω resistance, which has already existed on the power board. Please refer to Figure 2-7 for more details.

	1-2	2-3
120 Ω	ON	OFF

Figure 2-7

Refer to Figure 2-9 for the default connection mode, at this moment, the jumper cap on the power board is connected to the location 2~3 of the socket and 120Ω resistance hasn't been connected yet.

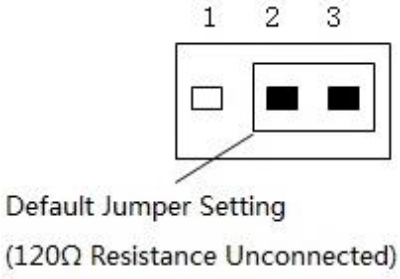

Figure 2-8

It needs to plug out the jumper cap from 2~3 location when it needs to connect to 120Ω resistance, and then connect to the location of 1~2. In this case, 120Ω resistance is connected to the circuit, which is shown in Figure 2-9.

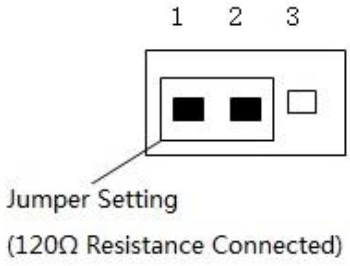

Figure 2-9

2.4 Reset Button and Micro-SD Card Installation

There is a reset button on the PCB which is located on the speed dome lateral (attached with label), the DIP switch is shown in Figure 2-10, the switch is moved to ON as 1. Reset button is used for system reset. As for DIP switch: 1 is the setting bit of 120Ω matched resistance, ON is to connect to 120Ω matched resistance, 2 is the neutral bit; 1 is the lowest bit and 2 is the highest bit.

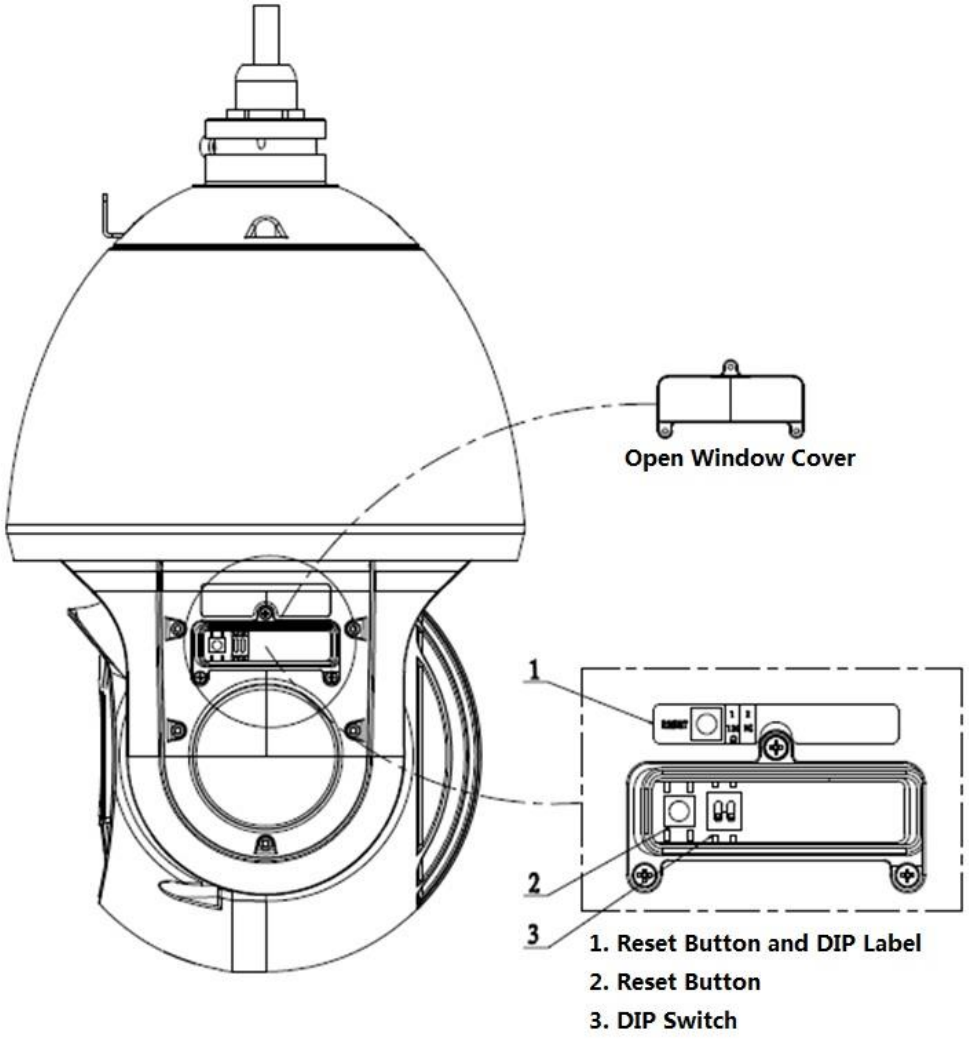

Figure 2-10

Note

For some other models, there are only reset button and DIP switch without any other buttons which are located on the PCB of speed dome lateral (without label), please refer to the actual device for installation.

SD card slot is located on the module control panel; it can be seen after you open the rear cover which is shown in Figure 2-11. Please pay attention to the direction of pulling and plugging Micro-SD card. First press the card slot downward slightly, move it towards the OPEN direction (refer to the instruction on the slot) and the card slot will become loose, and then lay the SD card. Please be noted that the card metal surface has to be corresponding with the golden finger of card slot, and then press down the card slot slightly, move it towards CLOSE direction.

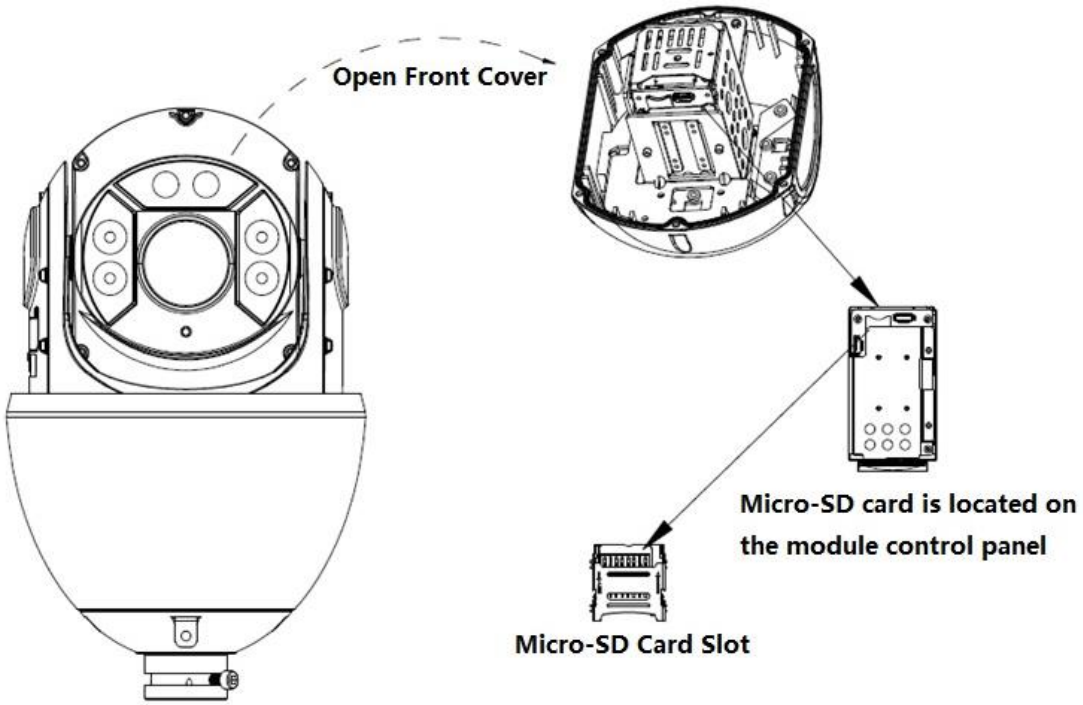

Figure 2-11

2.5 Speed Dome Installation

Note

The chapter can be applied to IR analog intelligent speed dome and IR network intelligent speed dome and so on.

There are various types of brackets which can meet different application scenarios for the speed dome, please refer to chapter 3 to chapter 6 for the installation methods. It is to take analog speed dome wall-mounted bracket as an example to install IR speed dome.

Step 1

Use quick mount screw on the speed dome and quick mount bayonet on the bracket to fix the speed dome on the bracket, and then fix the speed dome firmly by using M6 inner hex screw, which is shown in Figure 2-12.

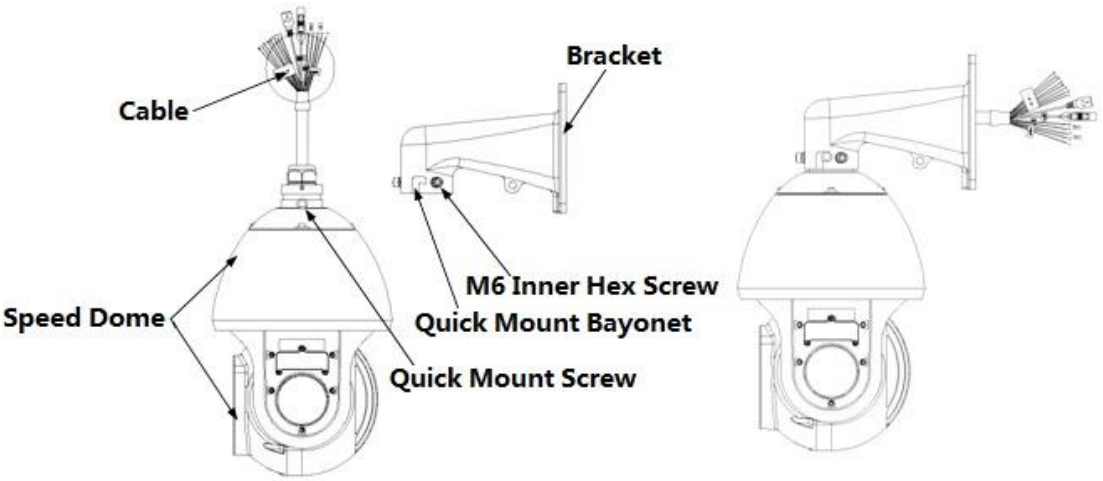

Figure 2-12

Step 2

Connect the power cable, video cable, audio cable, RS-485 control cable, alarm cable, network cable, high-frequency cable and optical fiber cable etc. well according to requirements, and then use insulated rubber tape to twine the cable connection well respectively to make it waterproof.

Note

The video port is covered with heat-shrinkable tube with high shrinkage ratio, it needs to heat and shrink the tubes on both sides after the video port is well connected, which is to make sure the video port is moistureproof and waterproof.

Step 3

Fix the speed dome together with bracket on the wall, which is shown in Figure 2-13.

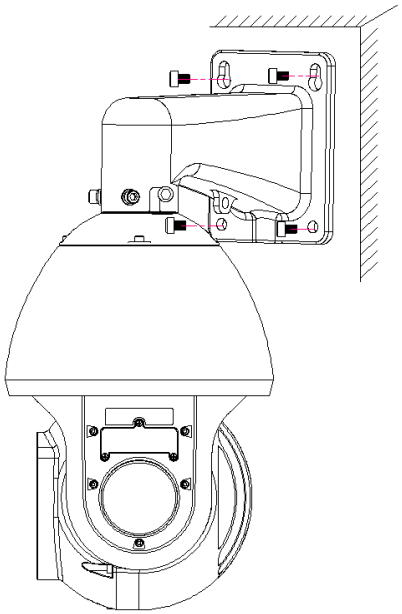

Figure 2-13

2.5.1 Install Quick Mount Connector

Twine Teflon tape over the thread of quick mount connector and rotate it into the tube thread of wall-mounted bracket, use M4 stainless screw to fix it, which is shown in Figure 2-14, the thread standard is G1 1/2 tube thread.

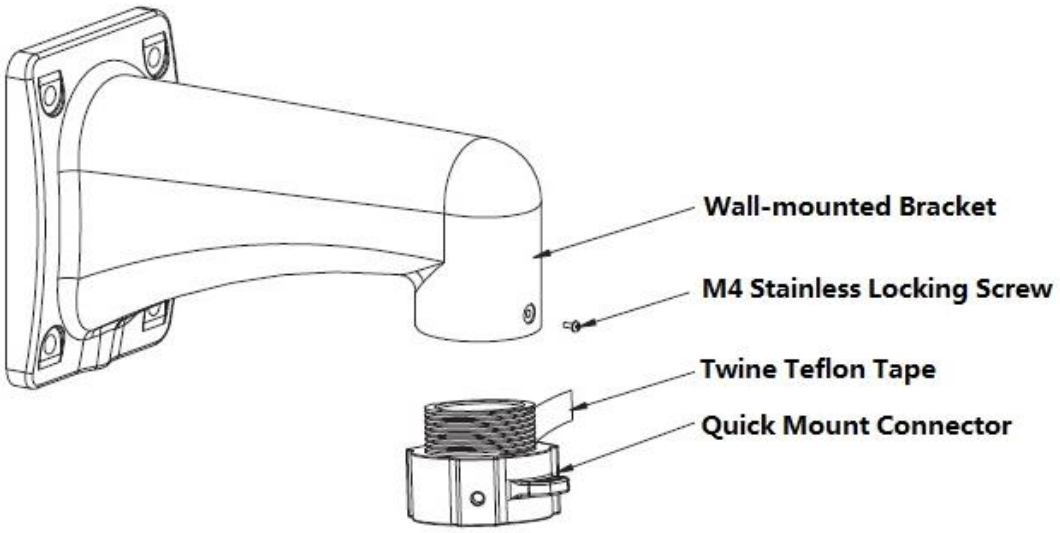

Figure 2-14

2.5.2 Speed Dome Cable

2.5.2.1 Cable Description

The camera is equipped with a multi-functional combination cable by default, which includes power cable, video cable, audio cable, RS485 control cable, alarm cable, network cable, high-frequency cable and optical fiber cable etc. The cable detail is shown in Figure 2-15.

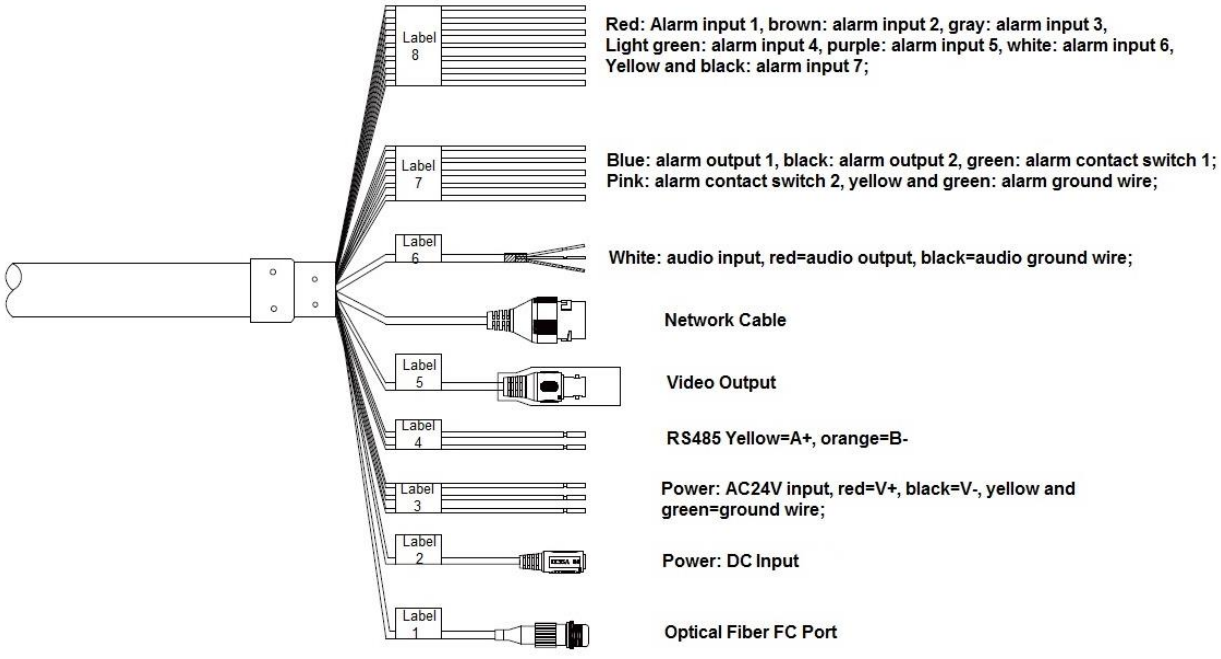

Figure 2-15

Note

Different models have different cable combinations; please refer to the actual cable combination for more details. The cable combination is the most comprehensive example shown in the figure above.

It is prohibited to pull the cable to lift the speed dome when moving the device, the wrong way of carrying device is shown in Figure 2-16.

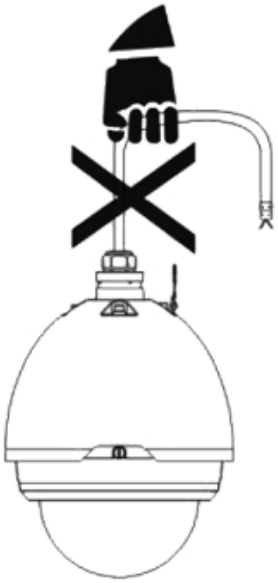

Figure 2-16

2.5.2.2 Cable Connection

Buckle the safety hook of speed dome on the quick mount connector; connect the integrated cable reserved by wall-mounted bracket to the corresponding power cable, video cable, audio cable, RS485 control cable, alarm cable, network cable, high-frequency cable and optical fiber cable etc. of the multi-functional combination cable of the speed dome (according to requirement), and then use insulated rubber tape to twine the cable connection well to make it waterproof, which is shown in Figure 2-16.

Note

During actual installation, make sure the wire diameter of the cable which is to connect to RS485 control cable can't be too big; otherwise it will affect the control effect. Please refer to appendix 3 RS485 bus for relevant introduction.

2.5.2.3 Alarm Cable Connection

The alarm cable connection mode and config steps are shown as follows:

Step 1

Connect alarm input device to the ALARM IN and ALARM GND of the user cable.

Step 2

Connect alarm output device to the ALARM OUT and ALARM COM of the user cable, alarm output is the relay switch output.

Step 3

Open the device WEB interface, make corresponding settings to the alarm input and output device in "Setup > Event > Alarm Setup". The alarm input of WEB is corresponding to the alarm input of the user cable. It is to set the corresponding NO and NC output according to the high and low level signal generated by alarm input device when alarm triggers.

Step 4

Set the alarm output situation of user cable on the WEB.

2.5.2.4 Connect Speed Dome GND Cable

Connect the power line YELLOW & GREEN of the combination cable to the lightning protection device, and make sure the lightning protection device is well grounded.

3 Wall Mount

IR intelligent speed dome mainly takes wall mount, here it takes wall mount as an example to introduce the installation components and modes of the speed dome.

3.1 Installation Components and Dimension

The dimension of wall-mounted bracket is shown in Figure 3-1; the dimension of quick mount connector is shown in Figure 3-2.

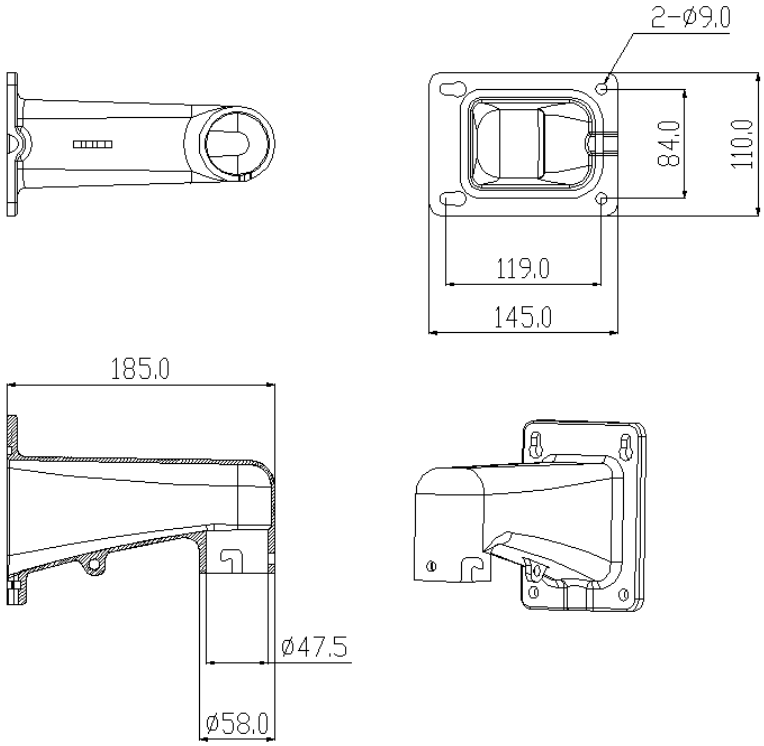

Figure 3-1

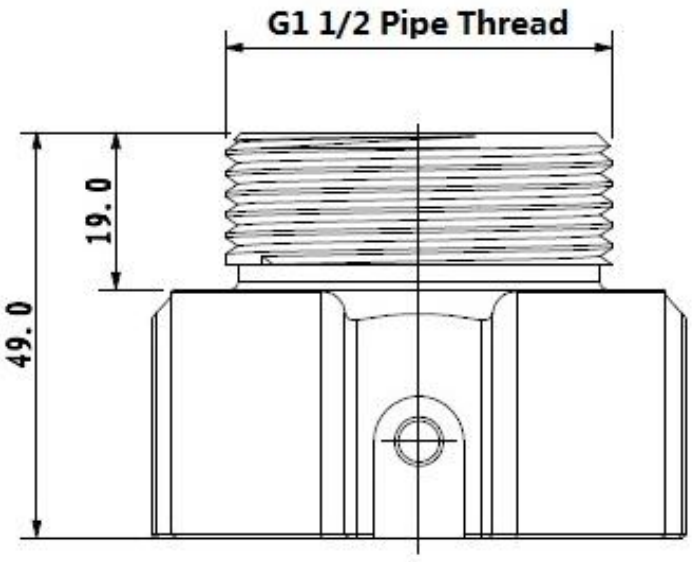

Figure 3-2

3.2 Installation Steps of Wall-mounted Bracket

3.2.1 Installation Conditions

Wall-mounted speed dome can be installed on hard wall structure in both indoor and outdoor environments. The wall needs to meet the following installation conditions:

- The wall shall be thick enough to install expansion bolts.
- The wall needs to sustain at least 8X weight of the camera and bracket etc.

3.2.2 Installation Steps

Step 1

Take the mounting hole of wall-mounted bracket bottom as template, draw the punching location on the wall and dig holes, then pre-bury the expansion bolts into the holes you just dug. Use 4 hex nuts and flat gasket to twist the wall-mounted bracket into the expansion bolts which have been pre-buried, which is shown in Figure 3-3.

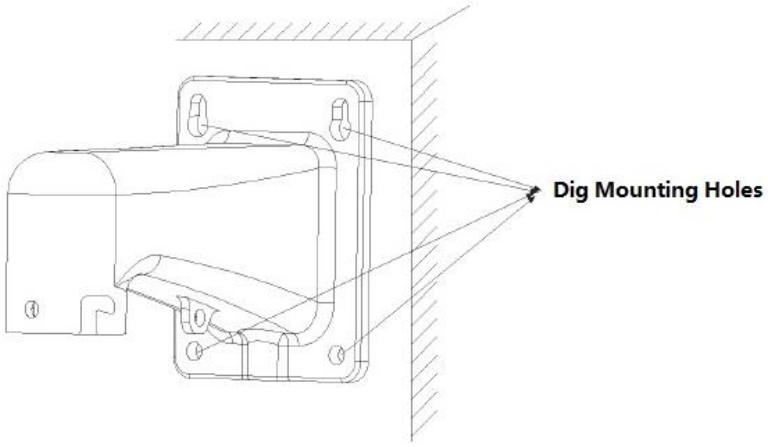

Figure 3-3

Step 2

Install the speed dome on the wall-mounted bracket, which is shown in Figure 3-4; please refer to “2.5 Speed Dome Installation” for more details.

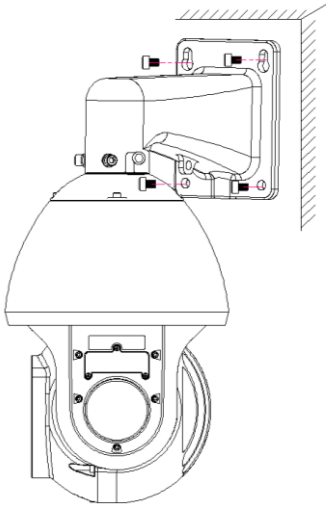

Figure 3-4

4 Hang Mount

4.1 Installation Component and Dimension

The hang-mounted bracket and installation accessories are shown in Figure 4-1, the dimension of hang-mounted bracket is shown in Figure 4-2, and the dimension of adapter block is shown in Figure 4-3.

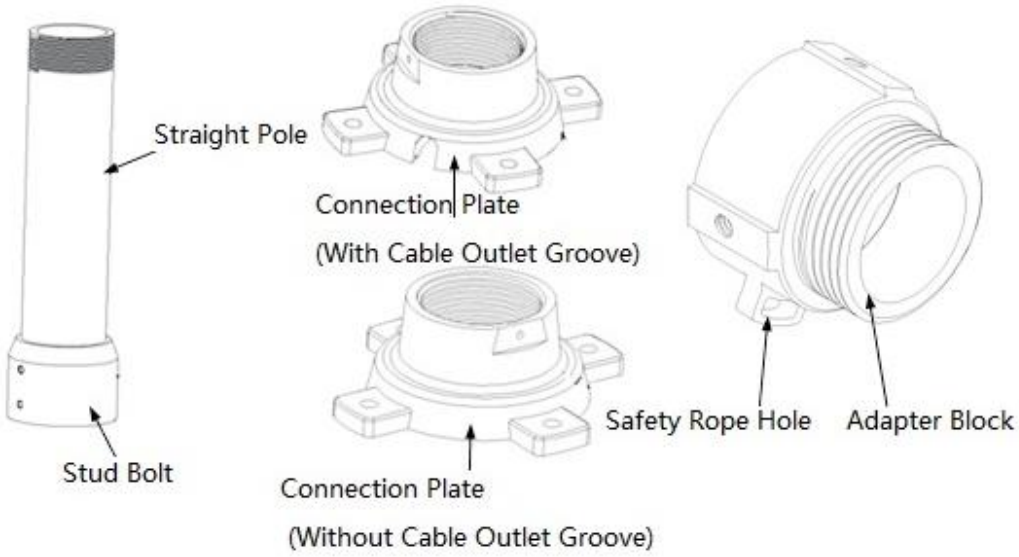

Figure 4-1

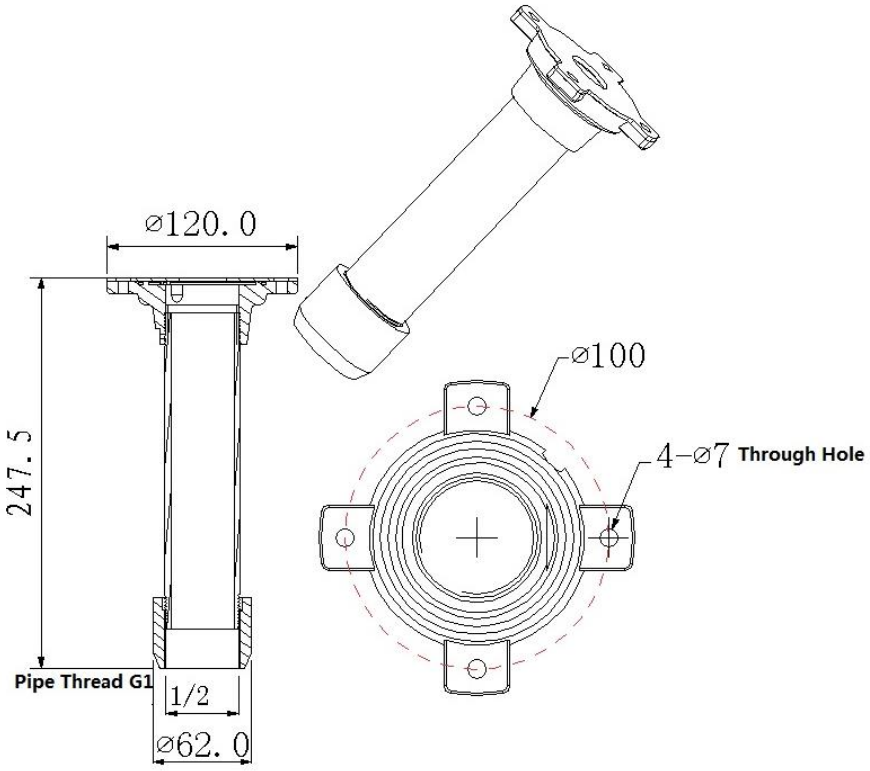

Figure 4-2

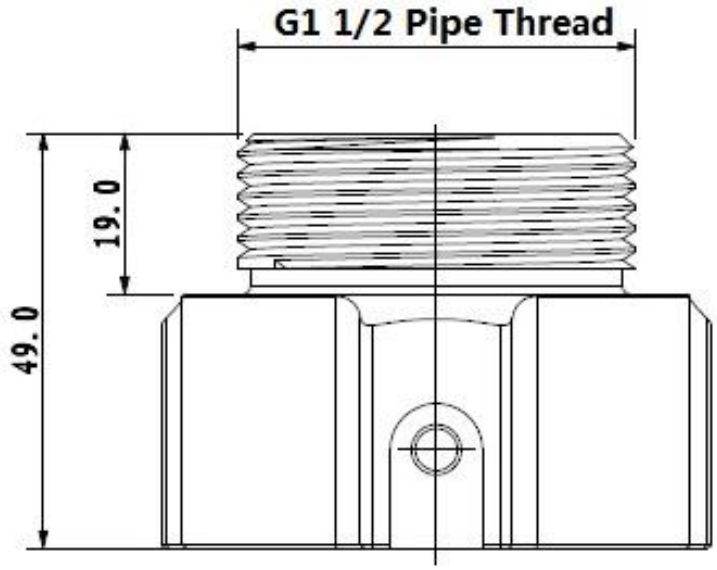

Figure 4-3

4.2 Installation Steps of Hang-Mount Bracket

4.2.1 Installation Conditions

Hang-mounted speed dome can be installed on hard wall structure in both indoor and outdoor environments. The wall needs to meet the following installation conditions:

- The wall shall be thick enough to install expansion bolts.
- The wall needs to sustain at least 8X weight of the camera.

4.2.2 Installation Steps

Step 1

Take the mounting holes of connection plate for hang-mounted bracket, draw the location of mounting holes on the ceiling and dig holes, then pre-bury the expansion bolts into the holes you just dug, which is shown in Figure 4-4.

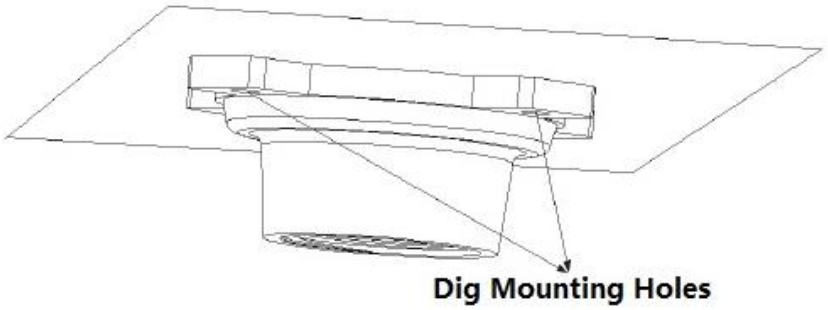

Figure 4-4

Note

If the speed dome is used in the indoor environment, it needs to cover silica gel on the contact surface between connection plate and ceiling, and the surrounding area of the cable exit hole, which is to make it sealed and waterproof.

Step 2

Install hang-mounted component

- Without Straight Pole

Fix the connection plate of hang-mounted bracket on the ceiling, and then twist the adapter block into the connection plate, which is shown in Figure 4-5.

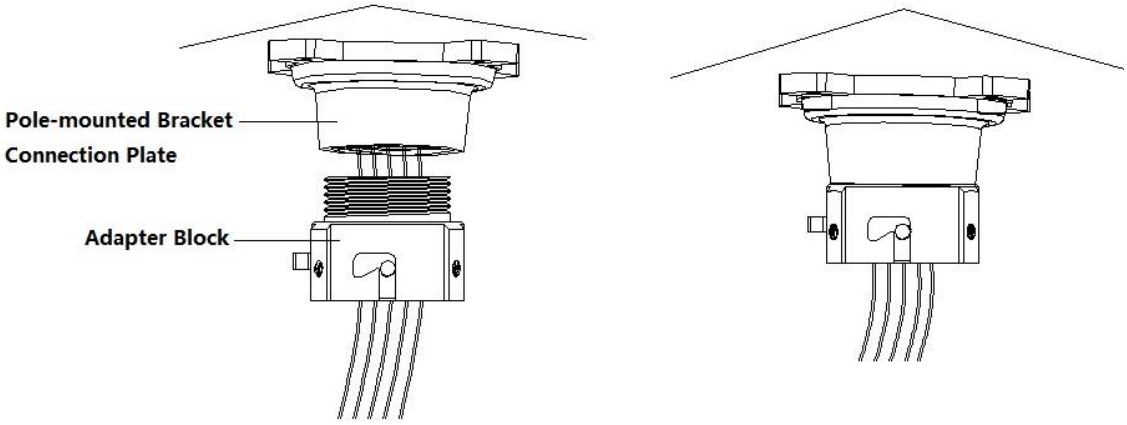

Figure 4-5

- With Straight Pole

First it needs to fix the connection plate of hang-mounted bracket on the ceiling, and then twist the straight pole into the connection plate, finally twist the adapter block into the straight pole of the hang-mounted bracket, which is shown in Figure 4-6.

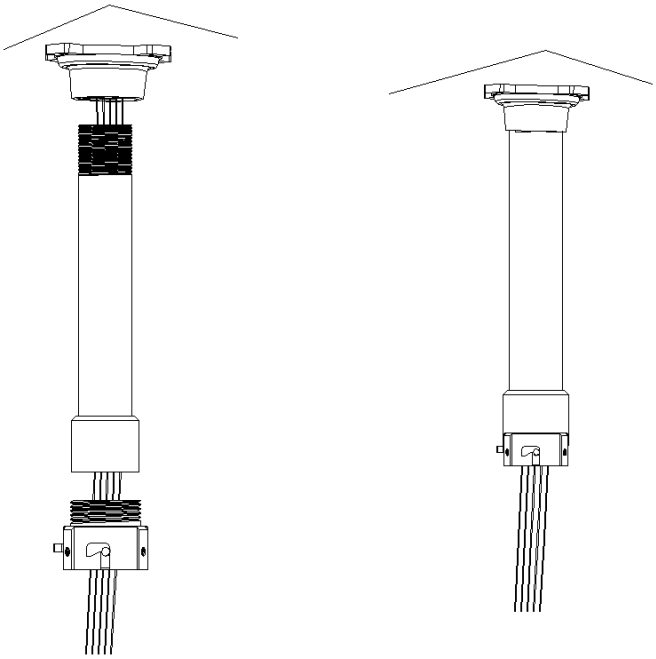

Figure 4-6

Step 3

Connect the power cable, video cable, audio cable, RS-485 control cable, alarm cable, network cable, high-frequency cable and optical fiber cable etc. well according to requirements, and then use insulated rubber tape to twine the cable connection well respectively to make it waterproof.

Note

The video port is covered with heat-shrinkable tube with high shrinkage ratio, it needs to heat and shrink the tubes on both sides after the video port is well connected, which is to make sure the video port is moistureproof and waterproof.

Step 4

Use the quick mount screw on the speed dome and the quick mount bayonet on the adapter block to fix the device on the adapter block, and then fasten the speed dome firmly via M6 inner hex screw, finally it is to connect the device to adapter block via safety buckle, which is shown in Figure 4-7.

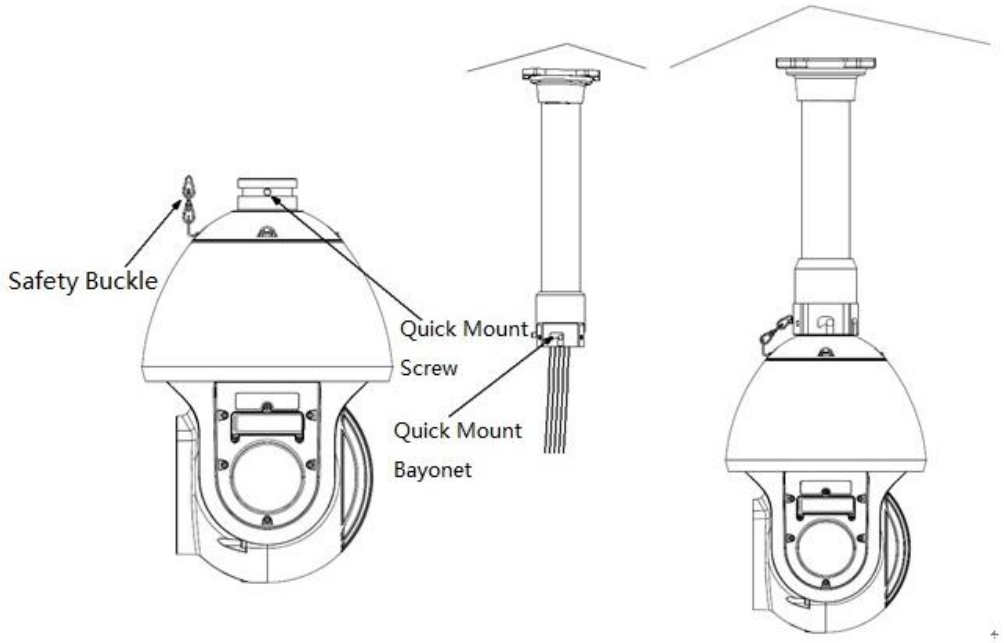

Figure 4-7

Note

If the speed dome is used in outdoor environment, it needs to twine enough Teflon tape on the thread of the upper hang pole and then rotate the pole on the hang-mounted flange; it needs to cover silica gel on the hang pole connection set and connector to make it sealed and waterproof.

5 Corner Bracket Installation

5.1 Installation Component and Dimension

Corner-mounted bracket and installation components are shown in Figure 5-1; the dimension is shown in Figure 5-2.

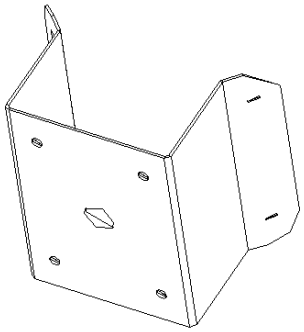

Figure 5-1

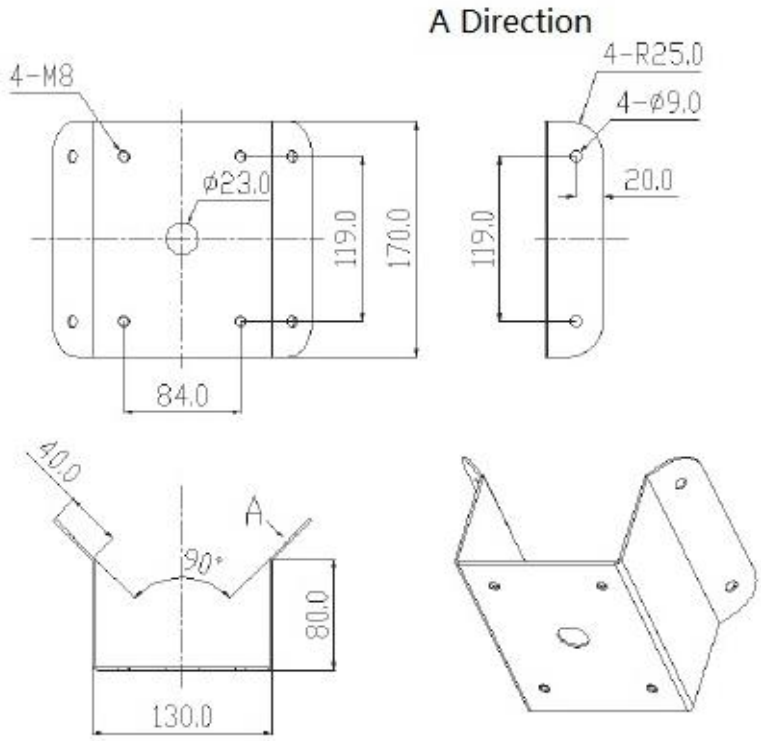

Figure 5-2

5.2 Installation Steps of Corner-mounted Bracket

5.2.1 Installation Conditions

Corner-mounted speed dome can be used on the hard wall structure with 90° included angle in both indoor and outdoor environments.

- The wall shall be thick enough to install expansion bolt.

- The wall shall sustain at least 8X weight of the speed dome.

5.2.2 Installation Steps

Step 1

Take the mounting hole of corner-mounted accessory as template, draw punching location on the wall with 90° included angle, dig holes and install M8 expansion bolts, use M8 nut to fasten the corner-mounted pedestal on the wall, which is shown in Figure 5-3.

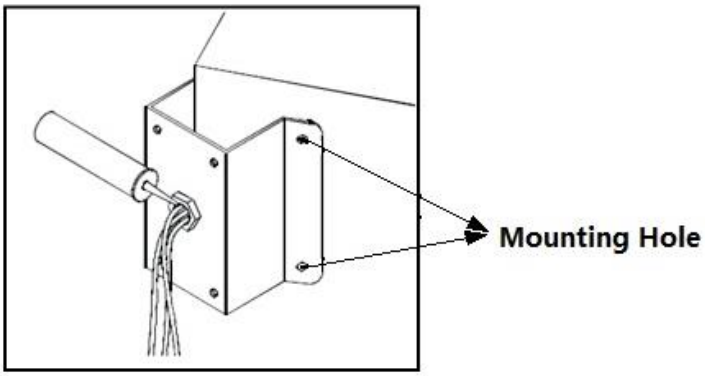

Figure 5-3

Step 2

Install speed dome, please refer to Figure 5-4 for the installation effect, and refer to “2.5 Speed Dome Installation” for installation modes.

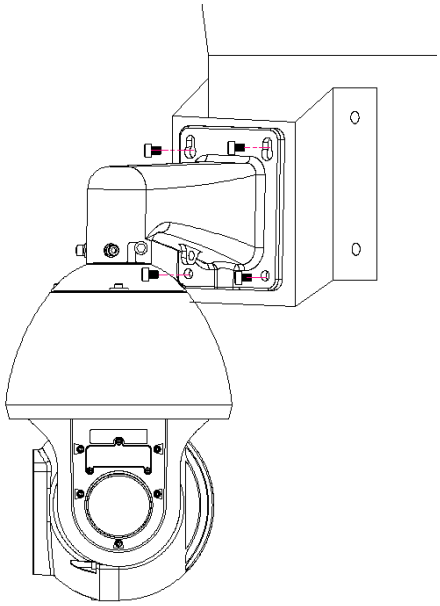

Figure 5-4

6 Pole-mounted Bracket Installation

6.1 Installation Components

Pole-mounted bracket and installation accessories are shown in Figure 6-1; dimension is shown in Figure 6-2.

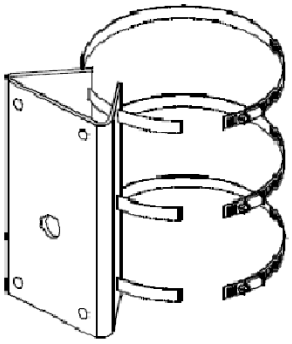

Figure 6-1

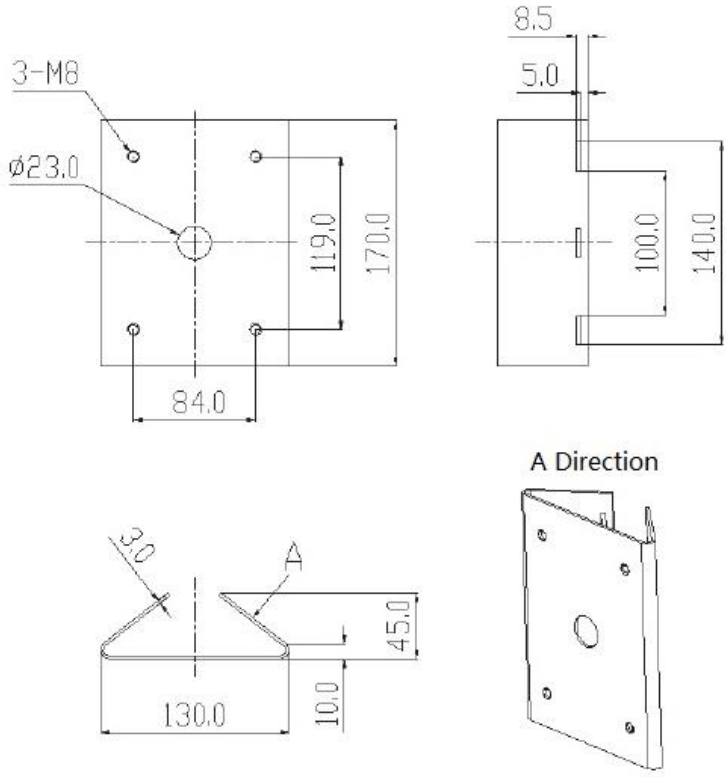

Figure 6-2

6.2 Installation Steps of Pole-mounted Bracket

6.2.1 Installation Conditions

Pole-mounted speed dome can be used on hard pole structure in both indoor and outdoor environment. Pole-mounted structure needs to meet the following installation conditions:

- The diameter of pole-mounted structure shall conform to the installation size of hose clamp. It is equipped with 5-inch clamp by default (fit for the column of φ80-130mm). It is used together with pole-mounted bracket, the diameter can be adjusted, and the adjustment range is the clamp specification (7 types of dimension for users to select): φ59-82mm, φ84-108mm, φ80-130mm, φ130-152mm, φ155-178mm, φ180-203mm and φ194-216mm. It can select according to the users' requirements, special dimension can be customized as well.
- The pole-mounted structure shall sustain at least 8X weight of the speed dome.

6.2.2 Installation Steps

Step 1

Install hose clamp and pole-mounted bracket, pull the cable through pole-mounted accessory, use hose clamp to fix the pole-mounted accessory on the pole, and then cover glass cement on the cable exit hole to make it sealed, please refer to Figure 6-3 for the installation effect.

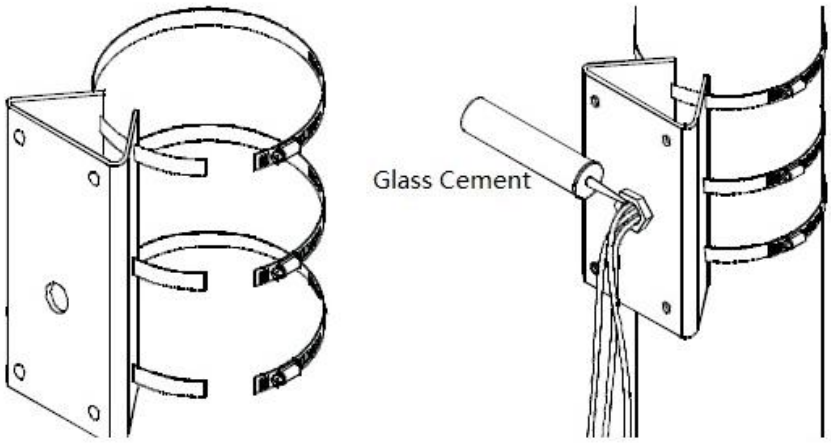

Figure 6-3

Note

Please check if the clamp is installed properly after installation, make sure it is firmly fastened otherwise it may cause clamp fracture if it is installed improperly.

Step 2

Install speed dome, which is shown in Figure 6-4. Please refer to "2.5 Speed Dome Installation" for more details about installation mode.

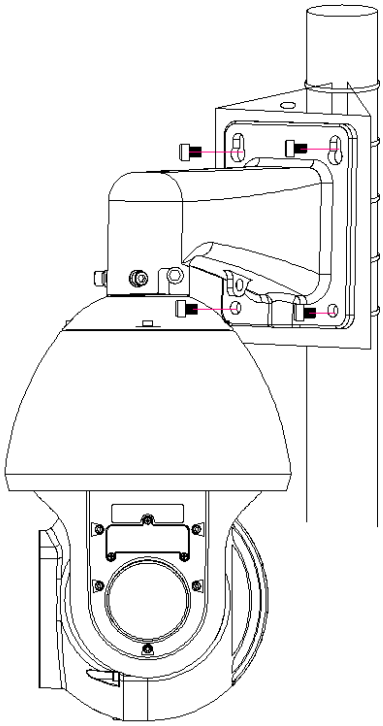

Figure 6-4

7 APPENDIX I THUNDER PROOF AND SURGE PROTECTION (Outdoors)

This series speed dome adopts TVS lighting protection technology. It can effectively prevent damages from various pulse signals below 6000V, 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 4Ω and earth cable cross-sectional area shall be no less than 25 mm². See Figure 7-1

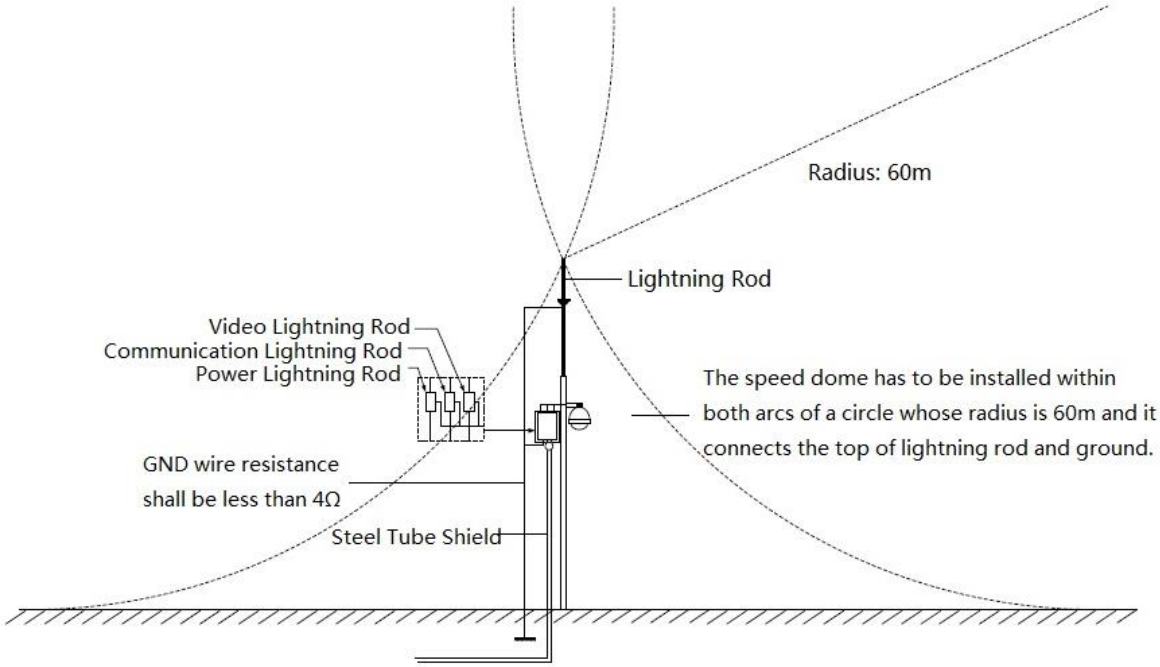

Figure 7-1

7.1 Lightning Protection (Indoors)

The yellow and green GND wire or GND screw of the speed dome should be reliably connected by several strands of copper wire with no less than 25mm^2 and indoor equipotential GND terminal. Please refer to Figure 7-2 for lightningproof installation mode.

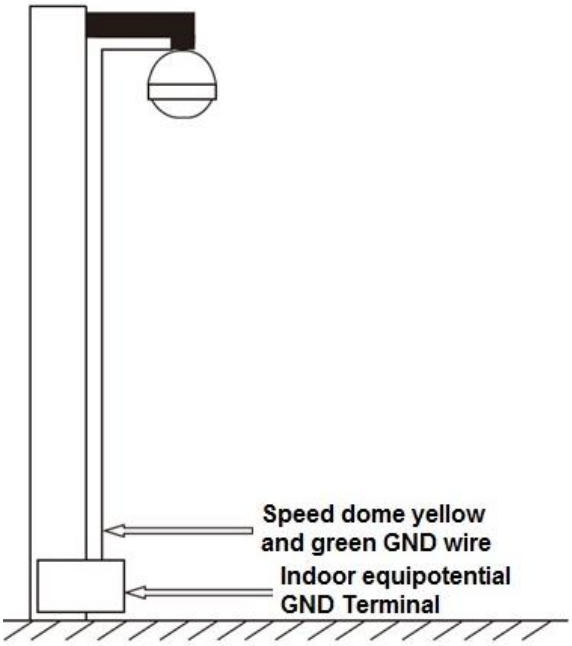

Figure 7-2

8 APPENDIX II ABOUT RS485 BUS

8.1 RS485 Bus Main Feature

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

8.2 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.

8.3 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 8-1). 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 speed dome is not under control or speed dome is running automatically and cannot stop.

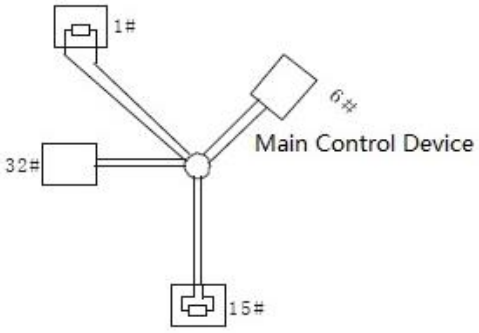

Figure 8-1

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 8-2.

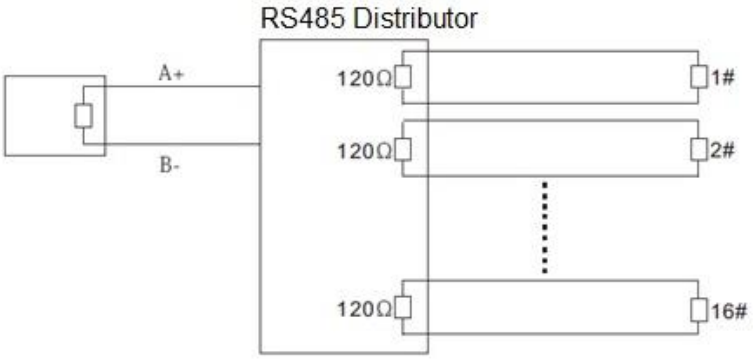

Figure 8-2

8.4 RS485 Bus FAQ

Phenomenon	Possible Reasons	Solution
Speed dome can run self-diagnosis but I cannot control it.	● Host address(baud rate) and speed dome address(baud rate) are not match; ● Positive and negative end of RS485 Bus are misconnected; ● Connection cable is loose; ● RS485 Bus connection are cut off;	● Modify host or speed dome setup ; ● Switch RS485 positive end and negative end; ● Fix connection cable firmly; ● Replace RS485 Bus.
I can control the speed dome but is not smooth	● RS485 Bus connection are not good; ● One RS485 bus is off; ● The distance between host and speed dome is too far; ● Parallel connected too much speed domes.	● Connect RS 485 Bus again; ● Replace RS485 Bus; ● Add terminal matching resistance; ● Add RS485 distributor.

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

It is the recommended max transmission distance when the cable diameter is fixed and the AC 24V power consumption is below 10%. (For the AC power supply devices, the max allowed voltage loss rate is 10%. For example, a device with rated power 20W, installed 141 feet (42m) away from the transformer, the needed minimum cable diameter is 0.8000mm).

mm / Feet（m） / w	0.8000	1.000	1.250	2.000
5	488.52（148.90）	763.31（232.66）	1192.67（363.53）	3053.25（930.63）
10	244.26（74.45）	381.66（116.33）	596.34（181.76）	1526.62（465.31）
15	162.84（49.63）	254.44（77.55）	397.56（121.18）	1017.75（310.21）
20	122.13（37.23）	190.83（58.16）	298.17（90.88）	763.31（232.66）
25	97.70（29.78）	152.66（46.53）	238.53（72.71）	610.65（186.13）
30	81.42（24.82）	127.22（38.78）	198.78（60.59）	508.87（155.10）
35	69.79（21.27）	109.04（33.24）	170.38（51.93）	436.18（132.95）
40	61.06（18.61）	95.41（29.08）	149.08（45.44）	381.66（116.33）
45	54.28（16.54）	84.81（25.85）	132.52（40.39）	339.25（103.40）
50	48.85（14.89）	76.33（23.27）	119.27（36.35）	305.32（93.06）
55	44.41（13.54）	69.39（21.15）	108.42（33.05）	277.57（84.60）
60	40.71（12.41）	63.61（19.39）	99.39（30.29）	254.44（77.55）
65	37.58（11.45）	58.72（17.90）	91.74（27.96）	234.87（71.59）
70	34.89（10.64）	54.52（16.62）	85.19（25.97）	218.09（66.47）
75	32.57（9.93）	50.89（15.51）	79.51（24.24）	203.55（62.04）
80	30.53（9.31）	47.71（14.54）	74.54（22.72）	190.83（58.16）
85	28.74（8.76）	44.90（13.69）	70.16（21.38）	179.60（54.74）
90	27.14（8.27）	42.41（12.93）	66.26（20.20）	169.62（51.70）
95	25.71（7.84）	40.17（12.25）	62.77（19.13）	160.70（48.98）
100	24.43（7.45）	38.17（11.63）	59.63（18.18）	152.66（46.53）

10APPENDIX IV THE RELATIONSHIP BETWEEN DC 12V CABLE DIAMETER AND TRANSMISSION DISTANCE

It is the recommended max transmission distance when the cable diameter is fixed and the DC 12V power consumption is lower than 10%. For the DC power supply devices, the max allowed voltage loss rate is 10%. The cable listed in the table below is copper wire (the resistivity of copper is ρ=0.0175Ω*mm²/m).

mm / Feet（m） / w	0.8000	1.000	1.250	2.000
5	122.13（37.23）	190.83（58.16）	298.17（90.88）	763.31（232.66）
10	61.06（18.61）	95.41（29.08）	149.08（45.44）	381.66（116.33）
15	40.71（12.41）	63.61（19.39）	99.39（30.29）	254.44（77.55）
20	30.53（9.31）	47.71（14.54）	74.54（22.72）	190.83（58.16）
25	24.43（7.45）	38.17（11.63）	59.63（18.18）	152.66（46.53）
30	20.35（6.20）	31.80（9.69）	49.69（15.15）	127.22（38.78）
35	17.45（5.32）	27.26（8.31）	42.60（12.98）	109.04（33.24）
40	15.27（4.65）	23.85（7.27）	37.27（11.36）	95.41（29.08）
45	13.57（4.14）	21.20（6.46）	33.13（10.10）	84.81（28.85）
50	12.21（3.72）	19.08（5.82）	29.82（9.09）	76.33（23.27）
55	11.10（3.38）	17.35（5.29）	27.11（8.26）	69.39（21.15）
60	10.18（3.10）	15.90（4.85）	24.85（7.57）	63.61（19.39）
65	9.39（2.86）	14.68（4.47）	22.94（6.99）	58.72（17.90）
70	8.72（2.66）	13.63（4.15）	21.30（6.49）	54.52（16.62）
75	8.14（2.48）	12.72（3.88）	19.88（6.06）	50.89（15.51）
80	7.63（2.33）	11.93（3.64）	18.64（5.68）	47.71（14.54）
85	7.18（2.19）	11.23（3.42）	17.54（5.35）	44.90（13.69）
90	6.78（2.07）	10.60（3.23）	16.56（5.05）	42.41（12.93）
95	6.43（1.96）	10.04（3.06）	15.69（4.78）	40.17（12.25）
100	6.11（1.86）	9.54（2.91）	14.91（4.54）	38.17

mm Feet（m） w	0.8000	1.000	1.250	2.000
				（11.63）

11APPENDIX V WIRE GAUGE REFERENCE SHEET

Metric bare wire diameter （mm）	AWG	SWG	Bare wire cross section （mm^2）
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

Note

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