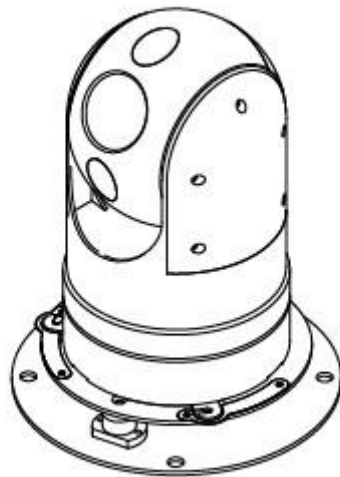


---

# **Infra Red Vehicle High Speed Dome Camera**

## **Manual operation**

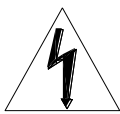
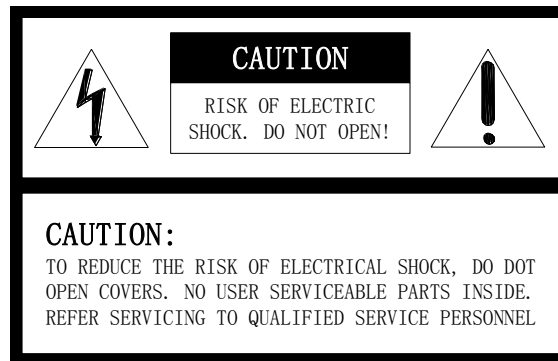
V1. 1



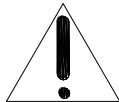
Please read the operation manual  
carefully before installing and using this product

---

## I. SAFETY PRECAUTIONS



The lightning flash with a arrowhead symbol, in an equilateral triangle, is intended to alert the user. There is uninsulated “dangerous voltage” presence near by the product’s enclosure which may be risk of to persons .



The exclamation point within an equilateral triangle is intended to alert the user to reference of the important operating and maintenance (servicing ) instructions .

THE PRODUCT CODE MARKED ON THE BOTTOM COVER. PLEASE  
FILL THE CODE IN THE FOLLOWING BLANK. PLEASE SAVING  
THIS SPECIFICATION CAREFULLY, SO THAT CHECKING.

MODEL: \_\_\_\_\_

PRODUCT CODE: \_\_\_\_\_

---

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## I. Important Safeguards

When you use sucker installing way,if the car's driving speed is more than normal driving speed ( $\geq 60\text{km/h}$ ) the car sucker base will not withstand the weight and momentum,therefore we must put it inside of the car.



### **Attention:**

**When installing the PTZ on a rugged mountain road leading to inallurate or preset control exception; please set NO 53 preset to reset the PTZ in order to maintain the preset position exactly.**

1. All the safety and operating instructions should be read before the units is operated.
2. Power supply for IR Dome Camera: DC12V. The power input power supply indicated on the base of dome or other related marking label.
3. During the course of transportation, storage and installation, the product should be avoided from incorrect operations such as heavy pressing, strong vibration etc, which can cause damage of product as there are sophisticated optical and electronic devices inside the machine.
4. Do not attempt to disassemble the camera. In order to prevent electric shock, do not remove screws or covers. There are no user-serviceable parts inside.
5. Always follow all electrical standards for safety when it is in operation. Adopt the particular power supply which is provided with the unit. RS-485 and video signal should keep enough distance with high voltage equipments and cables when they are in transmission. Precautions for anti-lightning and anti-surfing should be taken if necessary.
6. Do not operate it in case temperature, humidity and power supply are beyond the limited stipulations.
7. Do not let the camera aim at the sun or the object with extreme light whatsoever it is switched on or not. Do not let the camera aim at or monitor bright and standstill object for a long time.
8. Do not use aggressive detergent to clean the main body of the camera. Wipe dirt with dry cloth. If needed, mild detergent can be used suitably.
9. Operate the intelligent speed dome camera with great care to avoid shock or vibration. It operate incorrectly, the Speed Dome could be damaged.
10. Please ensure the installation position with enough endurance when you install the intelligent IR High speed dome camera.
11. If necessary, use a commercial lens cleaning paper to clear the lens windows. Gently wipe the lens window until clean.

---

## II. Description of Functions

This Infra Red High Speed dome Camera uses the highly integrated 16-bit processor, low power consumption, super stable. Built-in high-power infrared array light inside, ultra-high luminous efficiency, fill light uniform, smaller heat and night vision range up to 80 meters. It applies 0.9 ° precision motor-driven, low-speed running smooth and jitter-free. Using of industrial grade components, dome using with longer life.








### 1. Integrated Speed-Variable PAN/TILT

- a. Turning 360 ° horizontally and continuously with unlimited positions and an adjustable speed from 0.01 - 300 °/s; turning 0 - 90 ° vertically with a speed up to 120 °/s.
- b. Running stably at low speed with super lower noise. Pictures have no shaking.
- c. Automatic 180 ° flip and panoramic monitoring without blind point, the location precision up to  $\pm 0.1^\circ$ .

### 2. High Intelligent Degree

- a. As much as 256 preset positions can be preset with powerless memory.
- b. The camera can scan horizontally between two points and scan speed can be modified. The positions of linear scan are optional and the dome camera can scan the range larger or smaller than 180 ° between any two points with adjustable speed;
- c. Proportional pan function. The speed dome will depend on the amount of zoom. At telephoto zoom settings, the pan and tilt speeds will be slower for a given amount of joystick deflection than at wide zoom settings. This keeps the image from moving too fast on the monitor when there is a large amount of zoom. This slowing does not happen when going to a preset, but does occur in turbo mode when high zoom is selected. The minimum pan and tilt speeds are 0.1 degree per second at full zoom.
- d. The Integrated Protocol-D. Communication protocols are integrated inside the dome camera with selectable baud rate from 2400 bps to 19200 bps.

### 3. Functions of the Camera (It's displayed during the station of "ON", and it is only for SONY cameras) .

- a. Description of the Focus Control Mode: the user can adjust the focus of the camera manually. When the camera is on near focus, the icon  appears on the screen; when on the nearest state, the icon  appears while on the far focus, the icon  appears.
- b. Description of Backlight Compensation: when the object to be shot is dark and looks dim, the user can open the backlight compensation according to actual need and the icon  appears on the screen.
- c. Description of White Balance: when the image has color distort on the screen, the user can set different modes by orders. There are 6 modes for options: ① Indoor Mode  ② Outdoor Mode  ③ Touch Mode  ④ Automatic Trace of White Balance ATW ⑤ Manual WB-MAN ⑥ Automatic Mode.
- d. Description of ZOOM Control: user can "pull near" or "push far" the lens according to actual conditions, and the symbol  $\overset{W}{\square} \square \overset{T}{\square}$  appears on the screen in which the front part means optical multiplication while the rear part means digital

- multiplication.
- e. Electron shutter: it is 1/50 sec after the camera electrified, and it will display 50 on the monitor.
  - f. Setup of Image Effect: the camera works on OFF state under normal condition and no image effect symbol appears on the screen. When “B&W” appears on the screen, it means the camera is on black and white state.
  - g. AE mode: Manual/Auto control.
  - h. Illuminance: It is used only when the external brightness is extremely low. Normally the camera works on the automatic state. In case the external brightness is lower than 1Lux, the camera can be switch to the Zero Illuminance state automatically and icon appears on the screen. You can also set the Zero Illuminance state manually.

### III. Setup of Dome Camera

#### 1. Connection of the system

##### 1) Address/Protocol Code

Before installing, please ensure the control communications and baud rates of the dome systems, then setup the dome SW2 code as the same as the system, SW1 is used to set address of the dome camera, SW2 is used to set the protocol of communication and the baud rate used by the dome camera. And the code switch as Figure 1 shows.

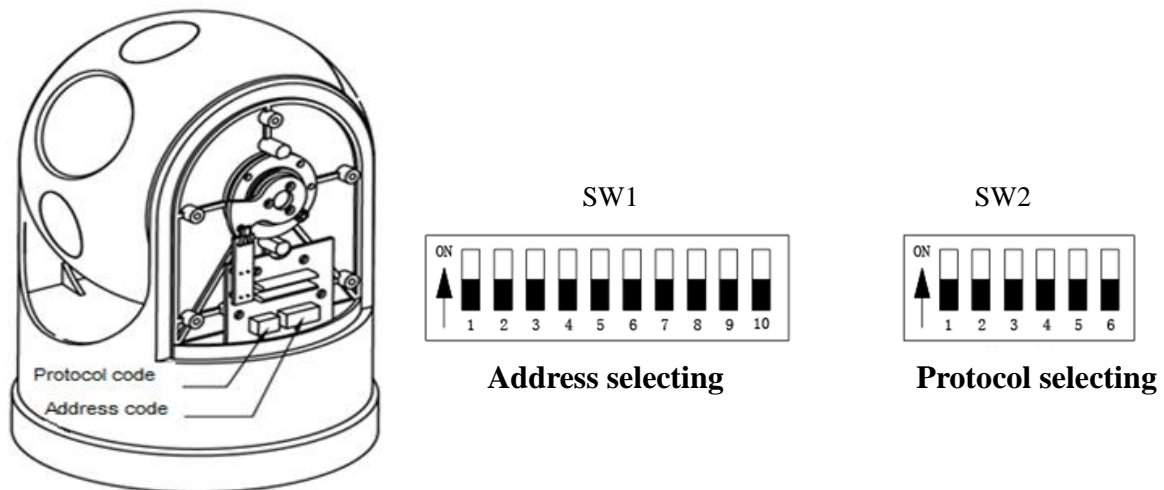


Figure 1

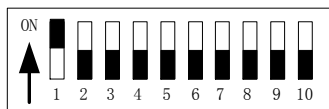
**2. Setup of Coding Switch of Dome Camera.** As figure 1 shows, J6(SW1) is used to set dome address, address of dome camera from 1~1023. The coding switches from DIP-10 to DIP-1 are equivalent to a 10-bit binary digital. DIP-10 is MSB while DIP-1 is LSB. The state “ON” of each bit means 1 while “OFF” means 0. Following table shows the States of Coding Switches.

| Dome Address | States of Coding Switches |       |       |       |       |       |       |       |       |        |
|--------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
|              | DIP-1                     | DIP-2 | DIP-3 | DIP-4 | DIP-5 | DIP-6 | DIP-7 | DIP-8 | DIP-9 | DIP-10 |
|              |                           |       |       |       |       |       |       |       |       |        |

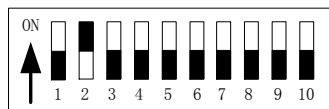
|      |     |     |     |     |     |     |     |     |     |     |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1    | ON  | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 2    | OFF | ON  | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 3    | ON  | ON  | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 4    | OFF | OFF | ON  | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 5    | ON  | OFF | ON  | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 6    | OFF | ON  | ON  | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 7    | ON  | ON  | ON  | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 8    | OFF | OFF | OFF | ON  | OFF | OFF | OFF | OFF | OFF | OFF |
| 9    | ON  | OFF | OFF | ON  | OFF | OFF | OFF | OFF | OFF | OFF |
| 10   | OFF | ON  | OFF | ON  | OFF | OFF | OFF | OFF | OFF | OFF |
| 11   | ON  | ON  | OFF | ON  | OFF | OFF | OFF | OFF | OFF | OFF |
| 12   | OFF | OFF | ON  | ON  | OFF | OFF | OFF | OFF | OFF | OFF |
| 13   | ON  | OFF | ON  | ON  | OFF | OFF | OFF | OFF | OFF | OFF |
| 14   | OFF | ON  | ON  | ON  | OFF | OFF | OFF | OFF | OFF | OFF |
| 15   | ON  | ON  | ON  | ON  | OFF | OFF | OFF | OFF | OFF | OFF |
| 16   | OFF | OFF | OFF | OFF | ON  | OFF | OFF | OFF | OFF | OFF |
| 17   | ON  | OFF | OFF | OFF | ON  | OFF | OFF | OFF | OFF | OFF |
| 18   | OFF | ON  | OFF | OFF | ON  | OFF | OFF | OFF | OFF | OFF |
| ...  | ... |     |     |     |     |     |     |     |     |     |
| 1023 | ON  | ON  | ON  | ON  | ON  | ON  | ON  | ON  | ON  | ON  |

Table 1

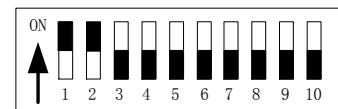
For example:



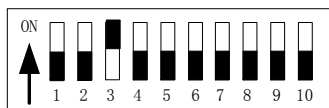
Speed Dome Address=1



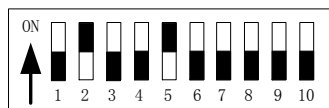
Speed Dome Address=2



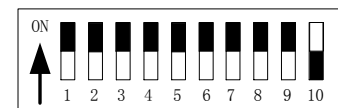
Speed Dome Address=3



Speed Dome Address=4



Speed Dome Address=18



Speed Dome Address=512

**3.Setup of the Protocol and the Default Baud Rate.** As table 2 shows, J8 (SW2)is used to set protocol and baud rate of dome camera. From DIP-4 to DIP-1of J8 is used to select protocol, Please setup from DIP-1 to DIP-4 as OFF, it is PELCL-D.

| Protocols Type | Selecting of protocol |       |       |       | Normal baud rate |       |
|----------------|-----------------------|-------|-------|-------|------------------|-------|
|                | DIP-1                 | DIP-2 | DIP-3 | DIP-4 | DIP-5            | DIP-6 |
| PELCO-D        | OFF                   | OFF   | OFF   | OFF   | OFF              | OFF   |
| PELCO-P        | OFF                   | ON    | OFF   | OFF   | OFF              | OFF   |

Table 2

**4. Setup of the Baud Rate of Communication.** As shown in Figure 2, J8 is used to set the protocol of communication and the baud rate used by the dome camera. DIP-6 and DIP-5 of

J8(SW2) are used to select the baud rate of communication and 4 different baud rates can be selected in maximum. If the controller adopts non-standard baud rate, you can adjust it to be identical with that of the main machine as per the following table.

| Baud Rate of Communication | Setup of Baud Rate |       |       |       |       |       |
|----------------------------|--------------------|-------|-------|-------|-------|-------|
|                            | DIP-1              | DIP-2 | DIP-3 | DIP-4 | DIP-5 | DIP-6 |
| 2400bps                    |                    |       |       |       | OFF   | OFF   |
| 4800bps                    |                    |       |       |       | ON    | OFF   |
| 9600bps                    |                    |       |       |       | OFF   | ON    |
| 19200bps                   |                    |       |       |       | ON    | ON    |

Table 3

### 5. Selection of the Terminal Resistor of the Dome Camera.

Please open the base of dome ,and there have 3-line jumper on base power control board, this is the select switch of the 120  $\Omega$  terminal resistor on the bus RS485, on which only one terminal resistor of the dome camera at the farthest end can be connected, while the terminal resistors of other devices should be opened.

120  $\Omega$  terminal resistor is connected on RS485 Bus,if 3-line jumper connecting 1,2.

120  $\Omega$  terminal resistor is turned off RS485 Bus, if 3-line jumper connecting 2,3.

## IV. Installing ways (Dome installing)

### 1) Dimension of Dome

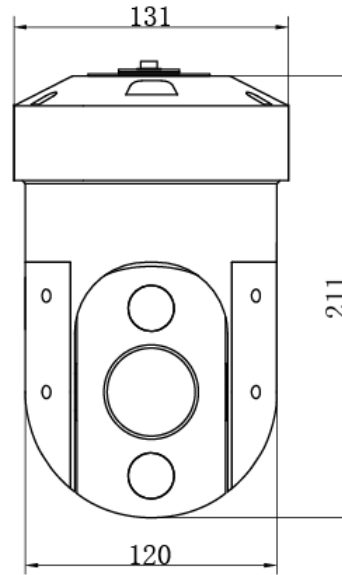


Figure 2

### 2) Installing ways

#### a) Wall Installation



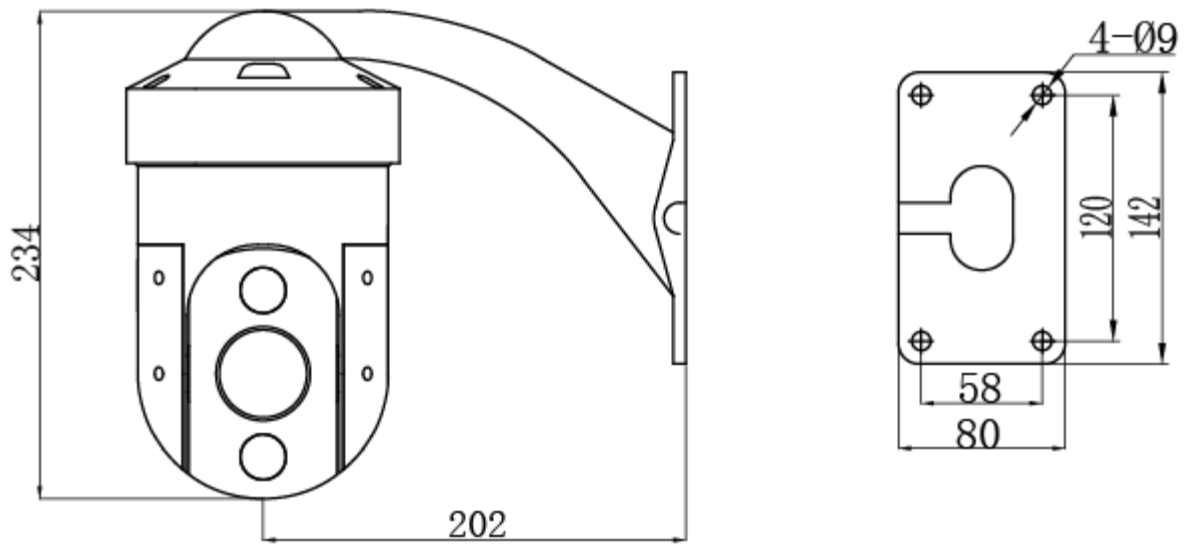


Figure 3

b) In-Ceiling Installation

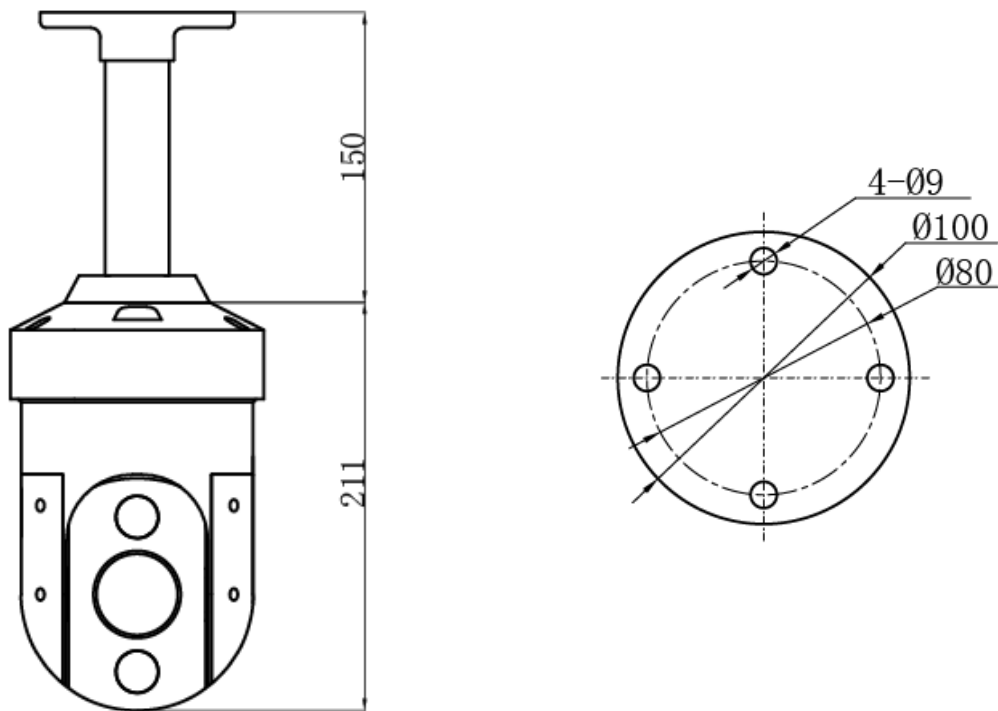


Figure 4

## V. Installing Steps

1. As Figure 5 shows, please remove the outer cover and take it out;

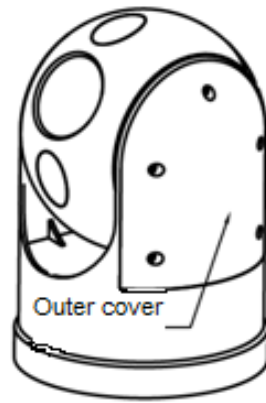


Figure 5

2. Please set the dome protocol and baud rate, also check the address of the dome.
3. Please fix the outer cover, and ensure the tightness of waterproof seals.
4. Please remove the cover board of bracket (Figure 6) .
5. Please fix the bracket on the wall (Figure 7) .
6. Please let system control wire, video wire, power wire go through the bracket (Figure 8) .

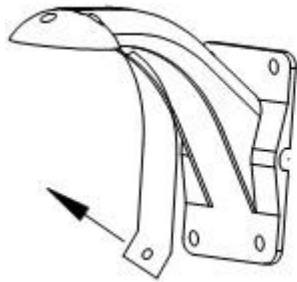


Figure 6

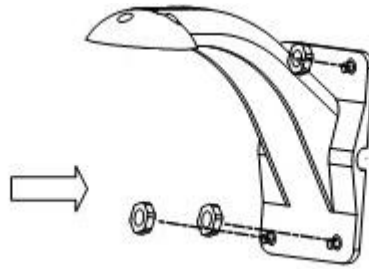


Figure 7

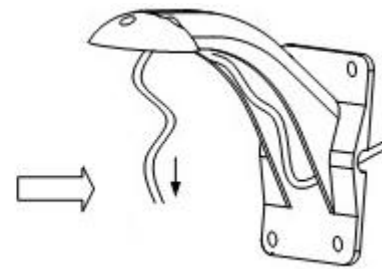


Figure 8

7. Please fix the dome to the bracket (Figure 9).

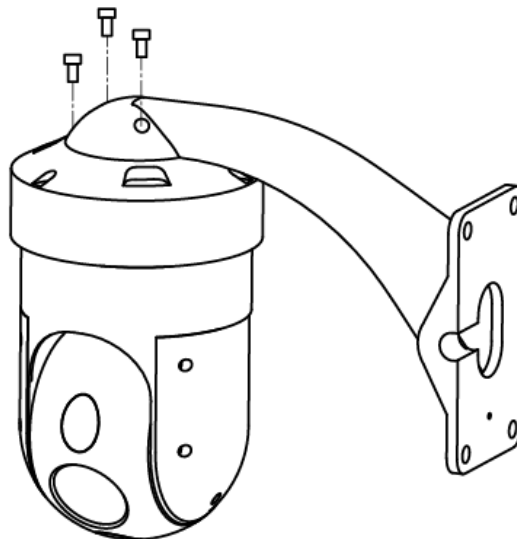


Figure 9

---

8. Please install the bracket cover board as Figure 10 shows.

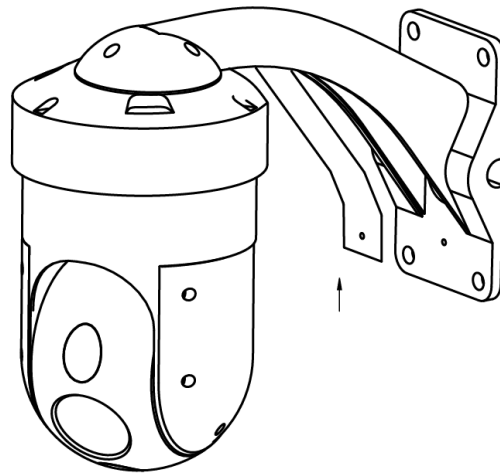


Figure 10

## VI. Installing ways (Vehicle surveillance dome installation)

1. Dimension as Figure 11 shows.

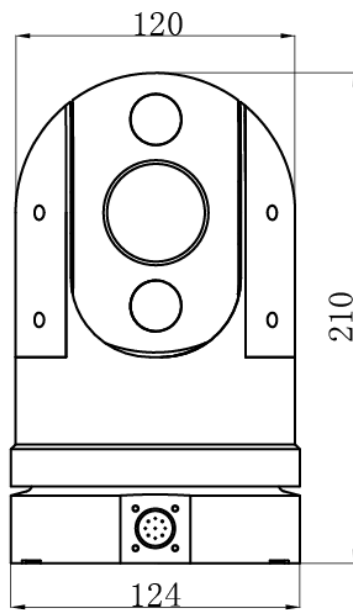


Figure 11

### 2. Installing ways of vehicle surveillance dome

2.1. Dimension of vehicle shock-absorb.

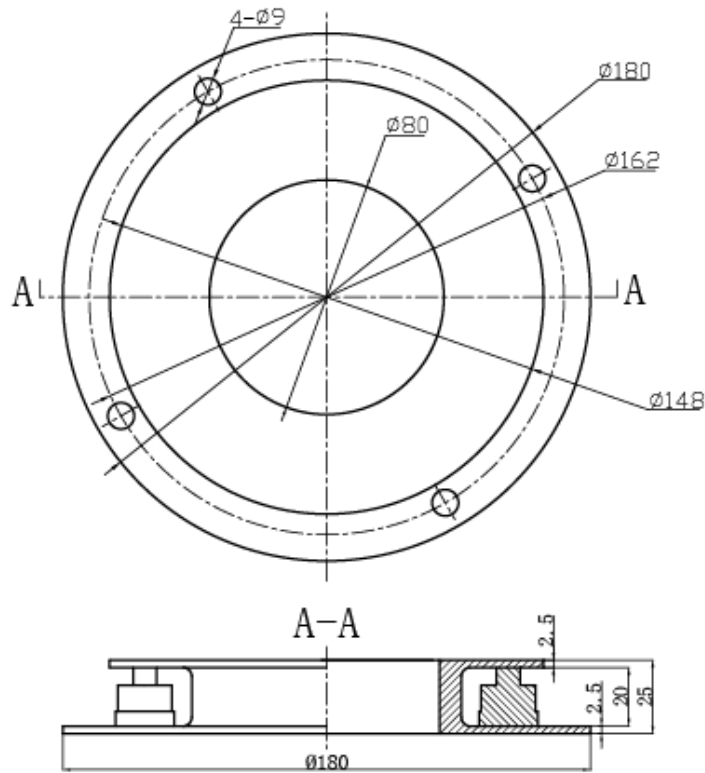


Figure 12

### 3.Step of installation

3.1. As figure 13 shows, please remove the outer cover and take it out.

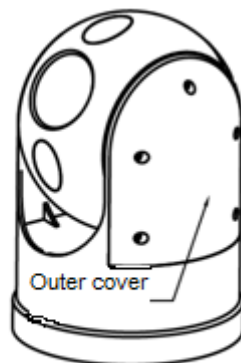


Figure 13

3.2. Please set the dome protocol and baud rate, also check the address of the dome.

3.3. Please fix the outer cover, and ensure the tightness of waterproof seals.

3.4. Please fix the vehicle shock-absorb to the bottom basement of the dome, and fix the whole dome.

3.5. Please connect the air socket outline in accordance with the connection wire color of the diagram correctly.

---

## VII.Installing ways (Sucker base installing)

1.Dimension as Figure 14 shows.

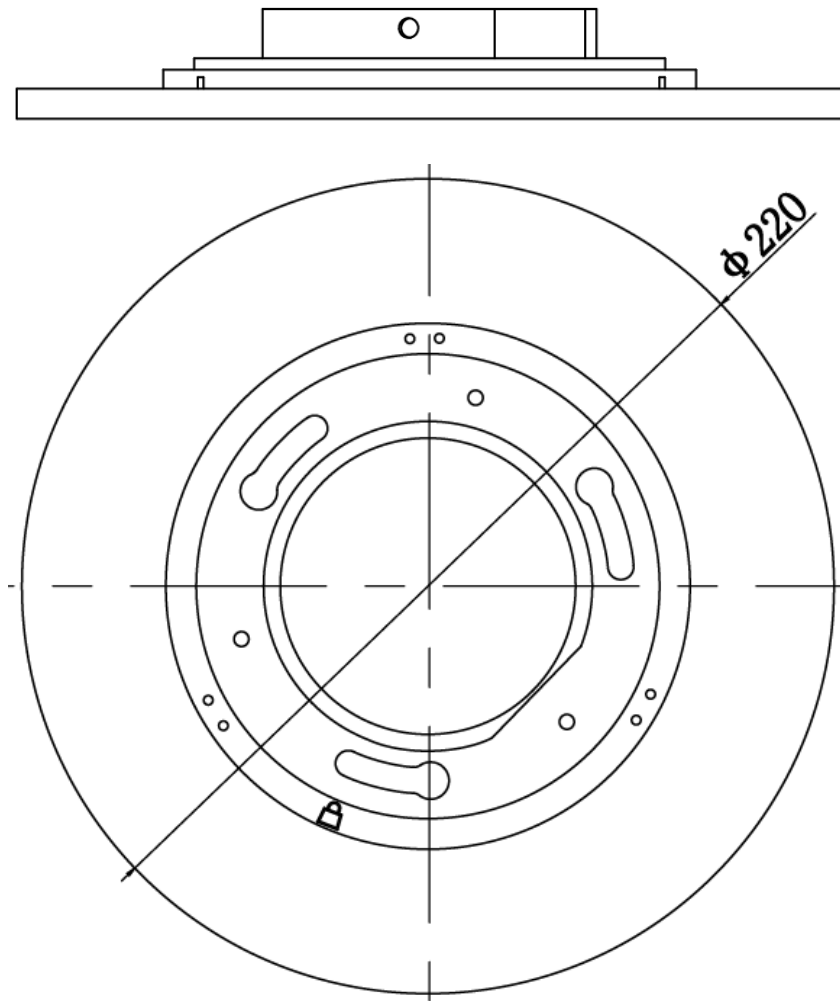


Figure 14

### 2.Installation instructions for the sucker base.

2.1First, make the dome's lock aligned with the Unlock stickers as shown in Figure 15-1.

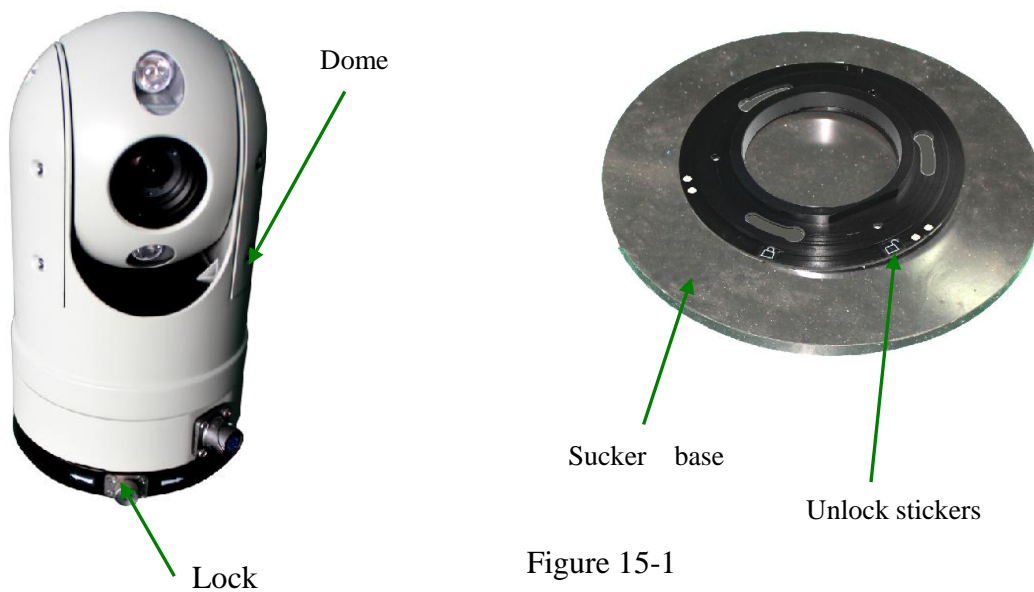


Figure 15-1

2.2 Put the dome into the sucker base and turn it clockwise to the stuck position (hear a click sound) to confirm that the latch clicks into the slot, as shown in Figure 15-2.



Figure 15-2

2.3 Make the anti-fall rope tied to one end of the base card port , the other end tied to the car suitable location as shown in Figure 15-3.

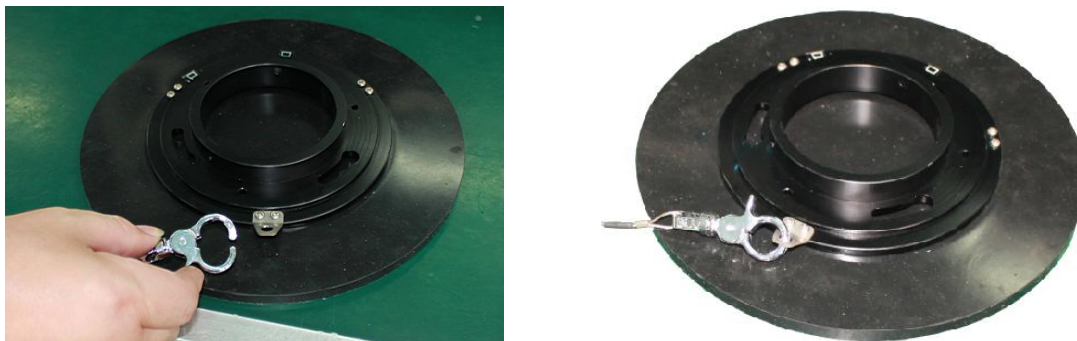


Figure 15-3

Additional: Removing dome instructions

1. Pull out the latch, and rotate the dome counterclockwise to the position as shown in Figure 15-6.



Figure 15-4

Figure 15-5



Figure 15-6

2. You could take out the dome towards to the up direction.

### VIII、 System Connecting

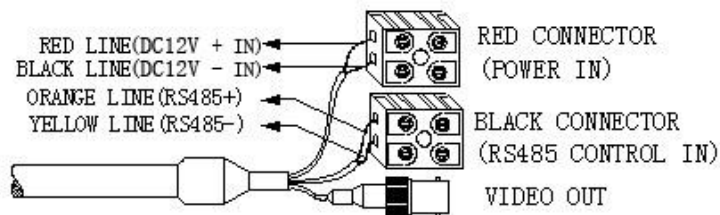


Figure 16

**Red: DC12V+**

**Black: DC12V-**

**Orange: RS485+**

**Yellow: RS485-**

### IX、 Installing attention:

#### To Ensure a Smooth and Successful Installation, You Should:

- 1、 Have electrical work to comply with latest national electrical code, national fire code, and all applicable local codes and ordinances.
- 2、 Coordinate with other trades to avoid interference.
- 3、 Verify existing conditions on the site and coordinate with owner side to ensure necessary utilities available.
- 4、 Copy all related plans, specifications, shop drawings and attachments to schedule and

coordinate related work.

- 5、 Thoroughly review the project to ensure that all jobs should meet or exceed the above requirements.  
Contact with the CCTV Project Coordinator to draw attention in case alleged discrepancies occur.

## X、 Technical Parameter

|                           |  |
|---------------------------|--|
| Power supply              | Normal dome: DC11V - DC12.8V 50/60Hz 2.0A<br>Car surveillance PTZ: DC11V -DC18V 50/60Hz 2.0A |
| Power consumption         | 18W Heater: 4W   |
| Preset position           | 256  |
| Zoom-rotation interaction | The dome will adjust the manual control speed automatically according to the current zoom.   |
| Auto overturning          | The camera will rotate 180° automatically, when it reaches the vertical position.            |
| Pan scanning              | 360° programmable  |
| Cruising track            | 2  |
| Pan speed(Max)            | 300 %S   |
| Pan running speed         | 0° ~ 220 %S  |
| Pan range                 | 360° continuously  |
| Tilt range                | PTZ: -20° ~ 95° Dome: 20° ~ -95°   |
| Tilt speed(Max)           | 120 %S   |
| Tilt running speed        | 0° ~ 90 %S   |
| Communication             | RS485  |
| Baud rate                 | 2400/4800/9600/19200 bps   |
| Fan / heater              | Auto control   |
| Infra Red distance        | 80m (2 groups Infrared light)  |
| Relative humidity         | 10-75% (without agglomeration)   |
| Work temperature          | Outdoor: -45°C ~ +60°C   |
| Weight                    | 2.5KG  |

## XI、 Dome commands

| Operation Command | Operation          | Operation Display (SONY) |
|-------------------|--------------------|--------------------------|
| Preset NO 1 point | Preset + 1 + Enter | SET 001                  |
| CALL NO 1 point   | Call + 1 + Enter   | POS 001                  |



|   |                        |                        |
|---|------------------------|------------------------|
| Auto scan                                 | Call + 141 + Enter     | SCAN POS001~002        |
| Counterclockwise 180 °horizontal rotation | Call + 33 + Enter      | PAN 180                |
| 360 °Auto scan (10 %s)                    | Call + 99 (149)+ Enter | SCAN 360               |
| Set the start point of scan               | Preset + 51+ Enter     | SET START              |
| Set the end point of scan                 | Preset + 50+ Enter     | SET END                |
| Auto scan start                           | Call + 51+ Enter       | SCAN                   |
| Auto scan stop                            | Call + 50+ Enter       |                        |
| Defrost open                              | Preset+52+Enter        |                        |
| Defrost close                             | Call+52+Enter          |                        |
| Cruise (From NO.1 to NO.16 )              | Call + 53 + Enter      | PATROL POS001~016      |
| Cruise 2 (from NO.21 to No.32 )           | Call +98 + Enter       | PATROL POS021~032      |
| Dome Reset                                | Preset + 53+ Enter     | SELF TEST              |
| BLC ON                                    | Call + 55+ Enter       | BLC ON                 |
| BLC OFF                                   | Preset+55+Enter        | BLC OFF                |
| D-ZOOM ON                                 | Call + 58+ Enter       | DIGI ON                |
| D-ZOOM OFF                                | Preset+58+Enter        | DIGI OFF               |
| AUTO Focus                                | Call + 59+ Enter       | AUTO FOCUS             |
| Manual Focus                              | Preset + 59+ Enter     | MAN FOCUS              |
| AUTO AE                                   | Call + 60+ Enter       | AUTO Exposure          |
| Manual AE                                 | Preset + 60+ Enter     | MAN IRIS               |
| WB AUTO                                   | Call + 61+ Enter       | AWB                    |
| WB Indoor                                 | call + 62+enter        |                        |
| WB Outdoor                                | preset+62+enter        |                        |
| WB ATW                                    | Preset + 61+ Enter     | ATW                    |
| Level reverse ON                          | Call + 63+ Enter       | Mirror ON              |
| Level reverse OFF                         | Preset + 63+ Enter     | Mirror OFF             |
| ICR OFF Color Mode                        | Call + 67+ Enter       | IRCUT OFF              |
| ICR ON B&W Mode                           | Preset+67+Enter        | IRCUT ON               |
| ICR AUTO Mode                             | call+56+enter          | IRCUT AUTO             |
| Fan ON                                    | Call + 201+ Enter      | FAN ON                 |
| Fan Auto (Fan Work 45 °above)             | Call + 202+ Enter      | FAN AUTO               |
| Adaptation Speed ON                       | Call + 210+ Enter      | LIM ON                 |
| Adaptation Speed OFF                      | Call + 211+ Enter      | LIM OFF                |
| Power failure memory OFF                  | Call + 220+ Enter      | PWR OFF                |
| Power failure memory ON                   | Call + 221+ Enter      | PWR ON                 |
| FLIP ON                                   | Call + 248+ Enter      | AFLIP ON               |
| FLIP OFF                                  | Preset + 248+ Enter    | AFLIP OFF              |
| AUTO HOME ON For Cruise (in 5 minutes)    | Call + 90+ Enter       | PARK ON                |
| AUTO HOME OFF                             | Preset+90+Enter        | PARK OFF               |
| AUTO HOME ON For NO.1 (in 5 minutes)      | Call + 251+ENTER       | PARK POS1              |
| AUTO HOME ON For SCAN (in 5 minutes)      | Call + 252 +ENTER      | PARK SCAN              |
| AUTO HOME ON For Cruise (in 5 minutes)    | Call + 253 +ENTER      | PARKPATROL             |
| SYSTEM RESET                              | Call + 54+ Enter       | RESET D                |
| SLOW Shutter ON                           | call+83+enter          |                        |
| SLOW Shutter OFF                          | preset+83+enter        |                        |
| Setup HD resolution 1080P_25(HD)          | preset+101+enter       | Power off and power on |
| Setup HD resolution 720P_60(HD)           | preset+102+enter       | Power off and power on |
| Setup HD resolution 1080i_60(HD)          | preset+103+enter       | Power off and power on |

## XII、 Troubleshooting

| Problems                                     | Possible Causes                            | Remedies   |
|--|--|--|
| No action when power is switched on          | Power supply fault                         | Replace  |
|  | Bad connection of the power                | Correct  |
|  | Transformer damaged                        | Replace  |
| Abnormal self-check. Images with motor noise | Mechanical failure                         | Repair   |
|  | Camera inclined                            | Reinstall  |
|  | Power supply not enough                    | Replace  |
| Normal self-check but no images              | Video signal fault                         | Reinstall  |
|  | Bad connection of the video                | Press to connect well  |
|  | Camera damaged                             | Replace  |
| Normal self-check but out of control         | RS485 bus bad connection                   | Check the RS485 connection   |
|  | Dome ID setup is wrong                     | Reselect   |
|  | Protocol setup is wrong                    | Reset and Switch ON again  |
| Vague image                                  | Bad connection of the video                | Press to connect well  |
|  | Power supply not enough                    | Replace  |
| Dome camera out of control                   | Self check error                           | Switch ON again  |
|  | Bad connection of control wire             | Replace  |
|  | Bad control of dome                        | Switch ON again  |
|  | Load much or communication distance is far | i. The farthest dome terminal resistor away from the control set to "ON" status, the rest set to "OFF" status.<br>ii. Adding code distributor. |

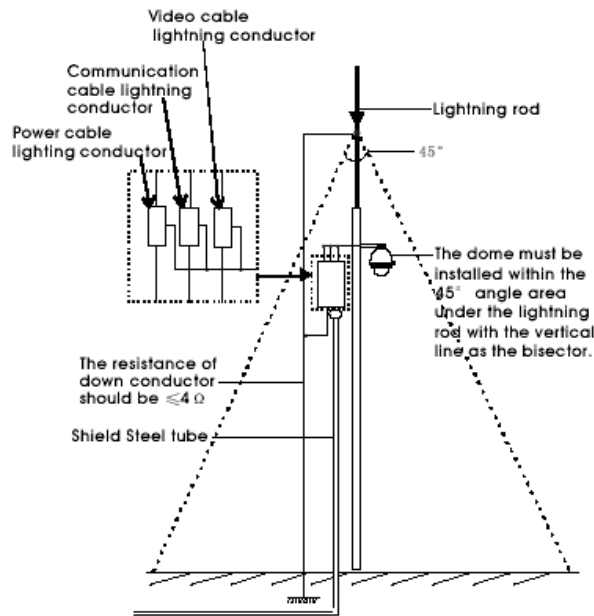
## Appendix I : Lightning Proof and Surge Signal Proof

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  $\leq 4\Omega$  and the sectional area of down conductor should be  $\leq 25\text{mm}^2$ .



<Figure 17>

## Appendix II : The Cleaning of Clear Dome Cover

To obtain constant clear videos, user should clean the down cover periodically.

- Be cautious when cleaning. Hold the down cover ring only to avoid direct touch to the acrylic down cover. The acid sweat mark of fingerprint will corrode the coating of down cover and scratch on down cover will cause vague images.
- Use soft dry cloth or the substitute to clean the inner and outer surfaces.
- For hard contamination, use neutral detergent. Any cleanser for high grade furniture is applicable.

## Appendix III : RS485 Bus Basic Knowledge

### 1. Characteristics of RS485 Bus

As specified by RS485 standards, RS485 Bus is of half-duplexed data transmission cables with characteristic impedance as  $120\Omega$ . The maximum load capacity is 32 unit loads (including main controller and controlled equipment).

### 2. Transmission distances of RS485 Bus

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

| Baud Rate | Maximum Transmitting Distance |
|-----------|-------------------------------|
| 2400 Bps  | 1800m                         |
| 4800 Bps  | 1200m                         |
| 9600Bps   | 800m                          |

Table 4

If user selects thinner cables, or installs the dome in an environment with strong electromagnetic interference, or connects lots of equipment to the RS485 Bus, the maximum transmitting distance will be decreased. To increase the maximum transmitting distance, do the contrary.

### 3. Connection and termination resistor

The RS485 standards require a daisy-chain connection between the equipment. There must be termination resistors with 120Ω impedance at both ends of the connection (refer to Figure 18).

Please refer to Figure 19 for simple connection. “D” should not exceed 7m.

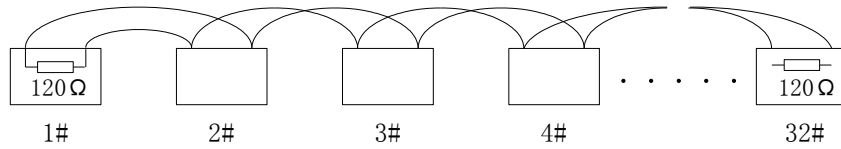


Figure 18

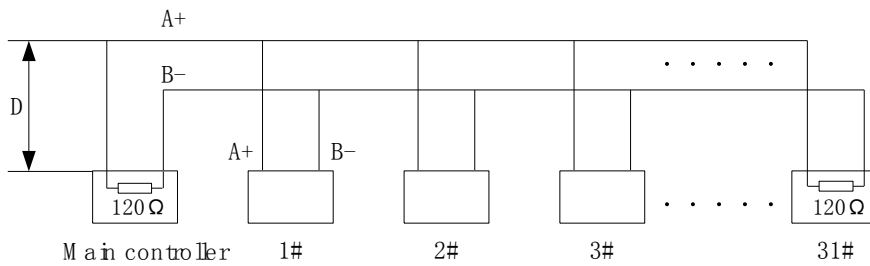
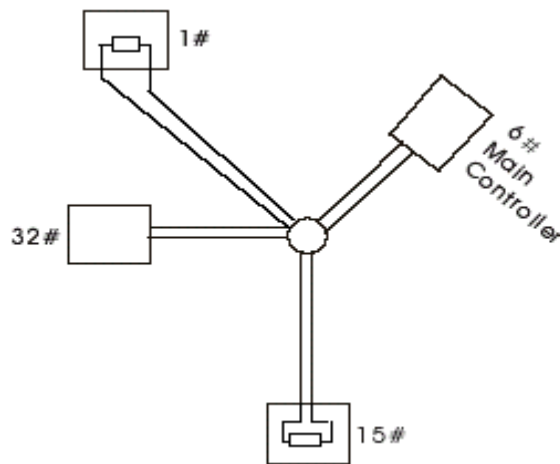


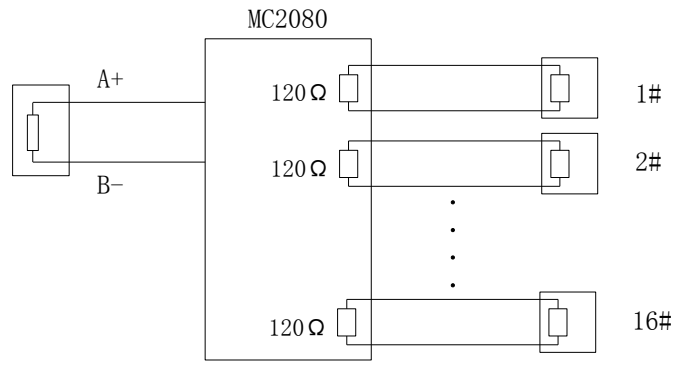
Figure 19

The connection of 120Ω termination resistor: The termination resistor is ready on the Protocol PCB. There are two kinds of connection. Refer to the Protocol PCB jumper setting form (refer to Picture 1).

- 1) In the Picture it is the factory default connection. The jumper is seated on Pin2&Pin3 and the termination resistor is not connected.
- 2) when connecting the 120Ω termination resistor, user should plug the jumper on Pin1&Pin2. and the termination resistor is connected.



<Figure 20>



<Figure 21>