

DH-ITC231 Camera ANPR System Installation Guide

Ver 1.0

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Table of Contents

| | |
|--|-----------|
| CHAPTER 1 INTRODUCTION | 1 |
| 1.1 OBJECTIVE | 1 |
| 1.2 SCOPE | 1 |
| 1.3 RANGE OF READER..... | 1 |
| 1.4 SYSTEM COMPOSITION | 1 |
| 1.4.1 Front-end Subsystem Composition..... | 1 |
| 1.4.2 Notifications of Front-end Subsystem Checklist Config..... | 2 |
| 1.4.3 Front-end Subsystem Composition..... | 2 |
| 1.5 MAIN DEVICE OF SYSTEM..... | 2 |
| 1.5.1 Main Device..... | 2 |
| 1.5.2 AUX Device | 5 |
| CHAPTER 2 SYSTEM PLAN | 7 |
| 2.1 SYSTEM INSTALLATION PLAN..... | 7 |
| 2.1.1 System Installation Plan 1 (Standard) | 7 |
| 2.1.2 System Installation Plan 2 (side installation) | 7 |
| CHAPTER 3 SYSTEM WIRING, DEVICE INSTALLATION AND CHECK..... | 9 |
| 3.1 SYSTEM WIRING..... | 9 |
| 3.1.1 System Wiring Map..... | 9 |
| 3.1.2 System Device Wiring Disassembly | 9 |
| CHAPTER 4 SYSTEM DEBUIGGING | 11 |
| 4.1 DEBUG CAMERA..... | 11 |
| 4.1.1 HD Camera Scene Requirement | 11 |
| 4.1.2 Adjust Camera Focus..... | 12 |
| CHAPTER 5 INDIA PLAN | 13 |
| CHAPTER 6 FAQ | 16 |

Installation Safety Notice

Construction personnel requirements: construction safety shall require a reflective vests and other protective device for the construction work.

Construction area requirements: the construction area and should set security tips, to ensure the construction of regional security, provides as follows:

Normal road: to place the vehicle 150 meters away from the construction site construction area warning signs followed by [], [construction road speed limit], [oriented brand], after setting a reasonable distance side of the road to the construction site safe direction, forming construction isolate area.

Freeway: to place in the vehicle to 1.5 km away from the construction site by the hard shoulder or central barrier (a safe place) at the [construction] job warning signs, directions to the construction site about 150 meters intervals in order to place the construction of road speed limits, respectively [brand], [oriented card], [from the construction site from the prompt card], after setting a reasonable distance side of the road to the construction site safe direction, and placed in the corner side of the road traffic guide [brand] isolation region formed construction and vehicle the whereabouts of the construction area 150 meters away from the safe place to put speed limit signs [Cancel].

Lifting or climbing work area requirements: the surrounding area should be set clear danger signs, hazard warning lights at night should be clearly set. Around shall be provided with special care, counseling pedestrian detour traffic. Below the work area strictly prohibited.

Engineering vehicle parking requirements: It should be noted truck parking position is suitable for overhead work, whether working vehicle support legs required to support the project in car extension arm operating range is a strong electric lines, stretching to touch the next time whether objects, etc. precautions.

Requirements when climbing: required to wear seat belts, wearing helmets, put good device, tools and belongings, to prevent falling objects wounding.

Strong electricity requirements: wiring, exposed part of the joint strong electrical specifications should be insulated and waterproof bandage, attention aging insulation box of waterproof materials; strong radio

access device end, the cable insulation shall at the same time ensuring the smooth lines Leather pressed into the terminals to avoid insulating layer and copper wire from the emergence of live wire exposed after heating; when the old line construction, to examine the electrical circuit should be carried out to ensure that no power lines after the construction operations.

Grounding Requirement: During installation, all electronic devices in the system must be grounded.

Chapter 1 Introduction

1.1 Objective

To instruct the engineering and technical personnel, engineering refer to standard construction, device installation to meet regulatory requirements, to ensure construction quality.

1.2 Scope

The instructions apply to model for the installation guide DH-ITC231 HD ANPR camera.

1.3 Range of Reader

Products Division, regional technicians, installation personnel, and customers are not included.

1.4 System Composition

This system is composed of front-end subsystem and rear-end platform software. Front-end subsystem mainly snapshot plate, analyze plate info, analyze vehicle behavior, store snapshot and etc. Platform software mainly stores picture, count vehicle flow (statistics), arm and etc.

This installation guide is for front-end subsystem, so only introduce you to installation and debugging of the subsystem.

1.4.1 Front-end Subsystem Composition

Front-end subsystem is composed of picture snapshot module (HD camera and HD lens), vehicle detection module (radar), strobe light module (LED fill light), picture backlight module (exposure light), data storage module (ITC terminal management device).

DH-ITC231 camera G-CMOS is 2.0 MP, so 1 channel is recommended, see chart below:

| No. | Device | Model | Quantity | Note |
|-----|-------------------------------------|-----------------|----------|---|
| 1 | All-in-one snapshot unit | ITC231-RU1A-IRL | 1 | All-in-one device can configure (optional built-in light-L, heat unit-H, heat and built-in light-HL); after you select all-in-one device, you do not need to select separate camera and housing |
| 4 | Cardan joint bracket | 8018 | 1 | |
| 5 | ITC MINI terminal management device | ITSE0804-GN5B-D | 1 | Optional |

1.4.2 Notifications of Front-end Subsystem Checklist Config

Before you set front-end subsystem, please be aware:

- Checklist does not contain protection device, please protection device;
- According to project experience, the system must be set with lighting protection of power and network;
- In case checklist change, subject to final release.

1.4.3 Front-end Subsystem Composition

Front-end subsystem is in Figure 1.4-1:

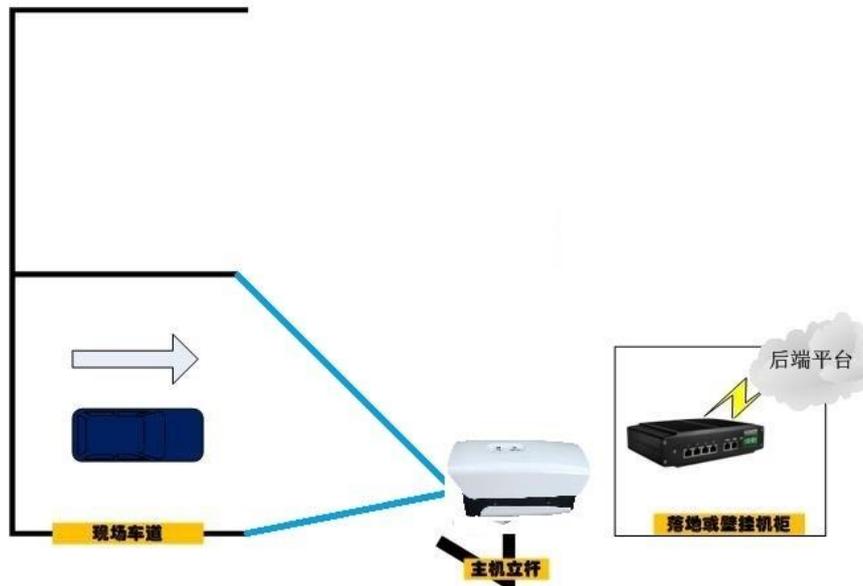


Figure .4-1

1.5 Main Device of System

1.5.1 Main Device

1.5.1.1 DH-ITC231 HD Camera

Dimension is in Figure 1.5-1:

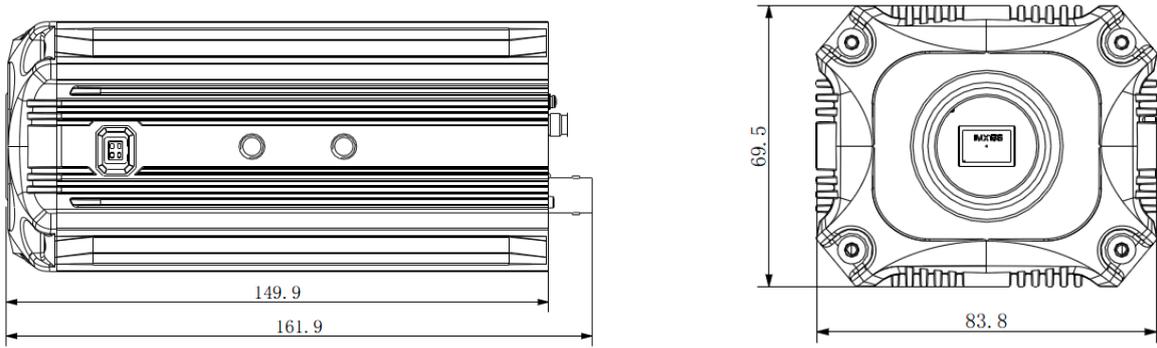


Figure 1.5-1

Rear panel of camera is in Figure 1.5-2:

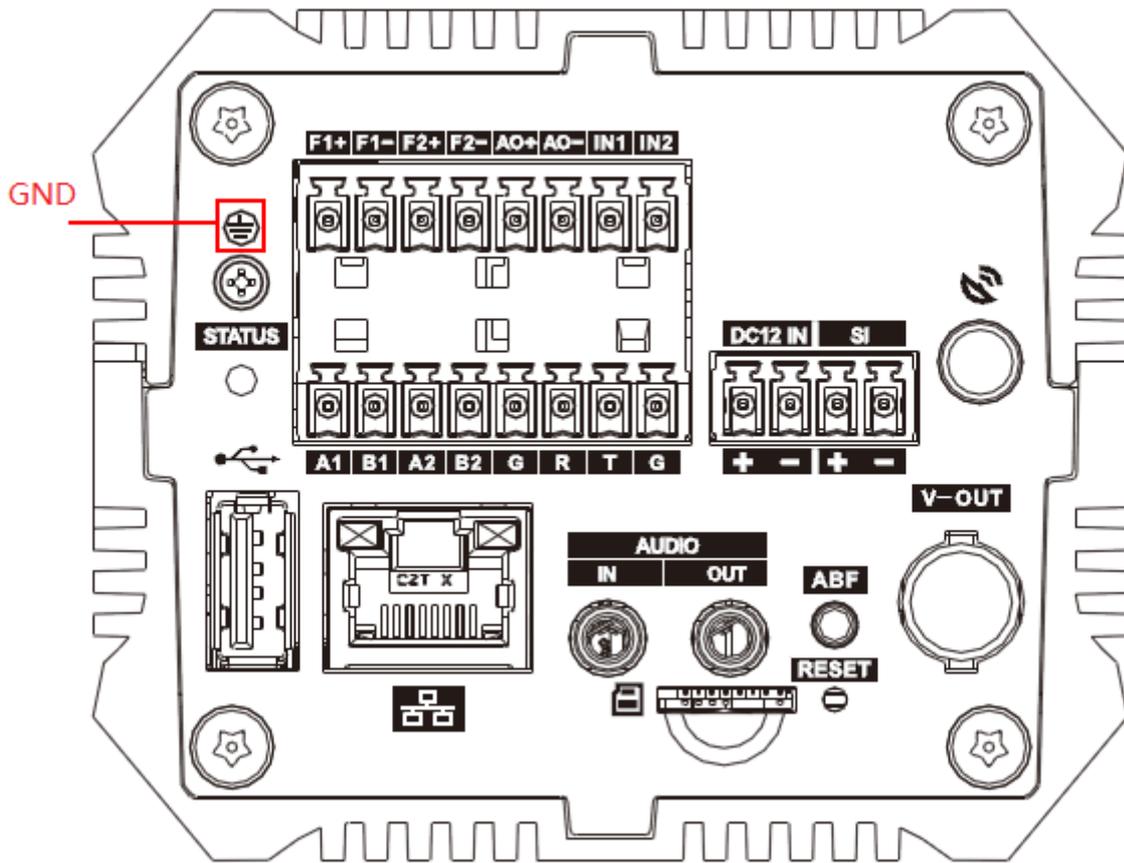


Figure 1.5-2

Rear interface definition and note2:

| Interface Name | | Function |
|----------------|-----------------------|---------------|
| DC 12 IN | Power input interface | Input 12V DC. |

| Interface Name | | Function |
|---|---|--|
| SI+, SI- | External frequency sync input interface | Camera sync external signal source (select external sync option and auto enabled, voltage range 12 Vp-p~36 Vp-p or AC 12V~AC 24V) . |
| RESET | Reset | Reset to default settings. When the device runs as normal (power indicator is blue), hold this button for 5 seconds, to reset. |
| STATUS | Indicator | Used to show camera work status, indicator definitions as: <ul style="list-style-type: none"> • Blue NO: running normally. • Red flashing: upgrade. • Red NO: in safe mode. |
| DC 12 OUT | Power output interface | Output 12V DC |
|  | GPS | Connect to external GPS antenna |
| V-OUT | Video output CVBS | CVBS (1.0Vp-p, 75Ω)。 |
| F1+, F1-, F2+, F2-, AO1, AO2 | 3 channels of output interface | Switch, can set output flash signal and strobe light signal. Warning: Page config must match actual connected light, otherwise light may be damaged. |
| IN1, IN2 | IO input interface | Provide 2 IO trigger snapshot interface or 2 alarm input interfaces. |
| A1 | RS485 interface 1 | RS485_A1 interface, control built-in light brightness by default, can customize external signal detector, vehicle detector, NO light and etc. |
| B1 | | RS485_B1 interface, control built-in light brightness by default, can customize external signal detector, vehicle detector, NO light and etc. |
| A2 | RS485 interface 2 | RS485_A2 interface, connect decoder control lens by default, can customize external signal detector, vehicle detector, NO light and etc. |
| B2 | | RS485_B2 interface, connect decoder control lens by default, can customize external signal detector, vehicle detector, NO light and etc. |
| G | GND | GND |
| R | RS232 serial | RS232_RX, RS232 serial receiver |
| T | | RS232_TX, RS232 serial sender |
|  | 1 network interface | Connect to standard Ethernet cable. Support POE |
| ABF | Auto focus | Auto focus |
|  | GND | Must ground this interface, improve device reliability, otherwise lighting protection will be ineffective. |
| AUDIO IN/OUT | Audio input/output | Audio input/output interface |

| Interface Name | | Function |
|---|-------------------|--|
|  | TF card interface | Connect to TF card. TF card usage note: <ul style="list-style-type: none"> • When you install TF card, please ensure TF card is not in reading/writing protection status, and insert it into slot. • When you remove TF card, please ensure TF card is not in reading/writing protection status, otherwise data may be lost and the card may be damaged. • Before you hot swap the TF card, please stop record. |

Chart 2

1.5.2 AUX Device

1.5.2.1 8018 Bracket and DH-ITABX-018BA Housing

1) 8018 Bracket

8018 bracket is in Figure 1.5-9, parameters as:

- Material: die-casting aluminum
- Installation method: wall mount
- Weight: 20kg
- Application: **DH-ITABX-018BA housing**
- Weight: 1.1kg
- Bracket length: 120×103×85mm

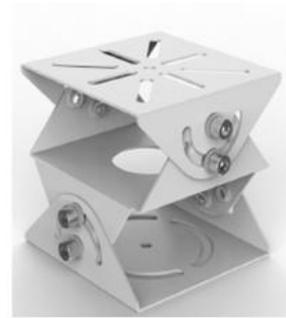


Figure 1.5-9 8018 bracket appearance

1.5.2.2 Cable

System cable as:

- Network cable: CAT FTP shielding cable
- AC220 power line: RVV3 * 1.5² ;
- Camera power line: RVV3 * 1.5² ;
- Flashlight trigger line: RVSP2 * 0.5² ;
- Strobe light trigger line: RVSP2 * 0.5² ;

1.5.2.3 Pole

Fixed camera use, detailed dimensions are according to installation on site. Level 12 anti-typhoon, and level 6 antiseismic required.

1.5.2.4 Outdoor Distribution Box

Used to install air switch, lightning protector, signal detector, plug and fiber splice tray. IP54 and built-in temperature control and fan required.

1.5.2.5 Air Switch, lighting protector and network lighting protector

Recommend Zheng Tai air switch, power DXH06-F light protector, model as FRX-SL-RJ45 network lighting protector.

1.5.2.6 Fiber optical transceiver, switch (Optional)

Recommend industrial level switch, model as HF-500 series FOT.

Chapter 2 System Plan

2.1 System Installation Plan

2.1.1 System Installation Plan 1 (Standard)

System installation plan is in Figure 2.1-1:

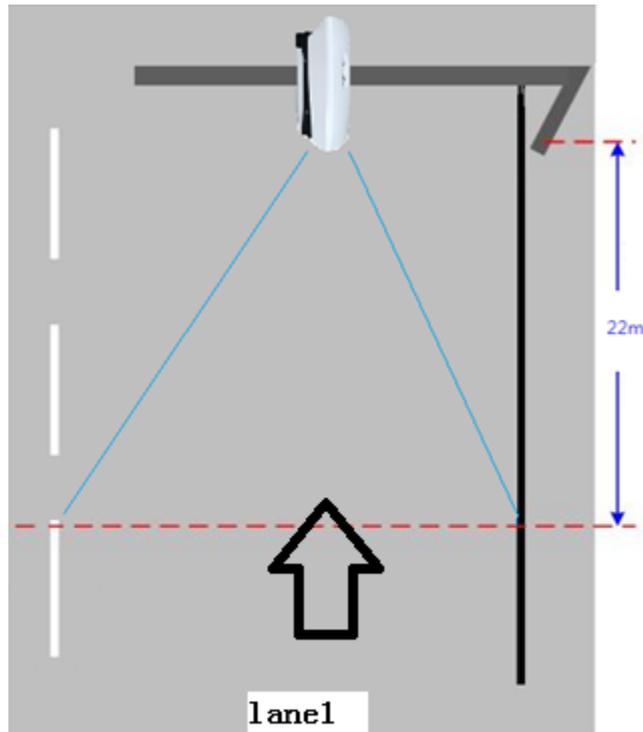


Figure 2.1-1

Pole and device installation distance note:

- Snapshot distance (vertical distance from snapshot line to pole) : 22 meters;
- Host installation pole height: 6 meters;
- Camera is installed above center of monitoring lane;
- **Recommend standard 1 lane installation plan.**

2.1.2 System Installation Plan 2 (side installation)

System installation plan is in Figure 2.1-2:

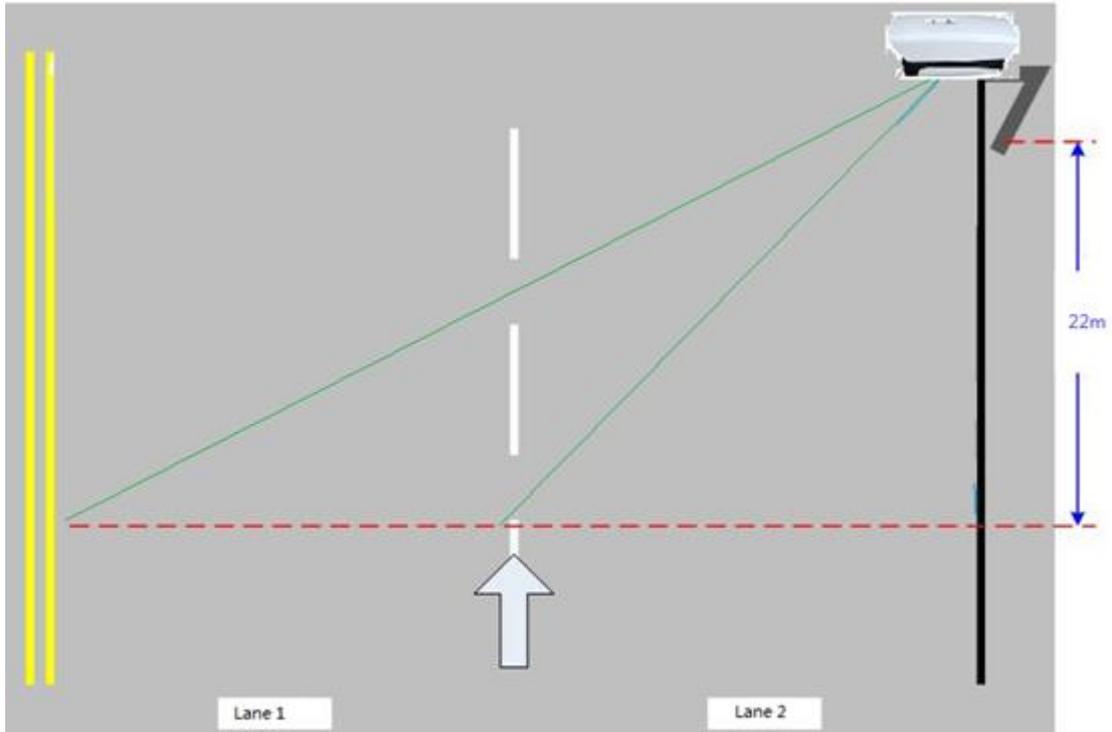


Figure 2.1-2

Pole and device installation distance note:

- Snapshot distance (vertical distance from snapshot line to pole) : 22 meters;
- Host installation pole height: 6 meters;
- The limit of side install is the 2nd lane, not 3rd lane since its side installation is too big, cannot be detected.
- Only monitor 1st lane.

Chapter 3 System Wiring, Device Installation and Check

3.1 System Wiring

3.1.1 System Wiring Map

System wiring is in Figure 3.1-1:

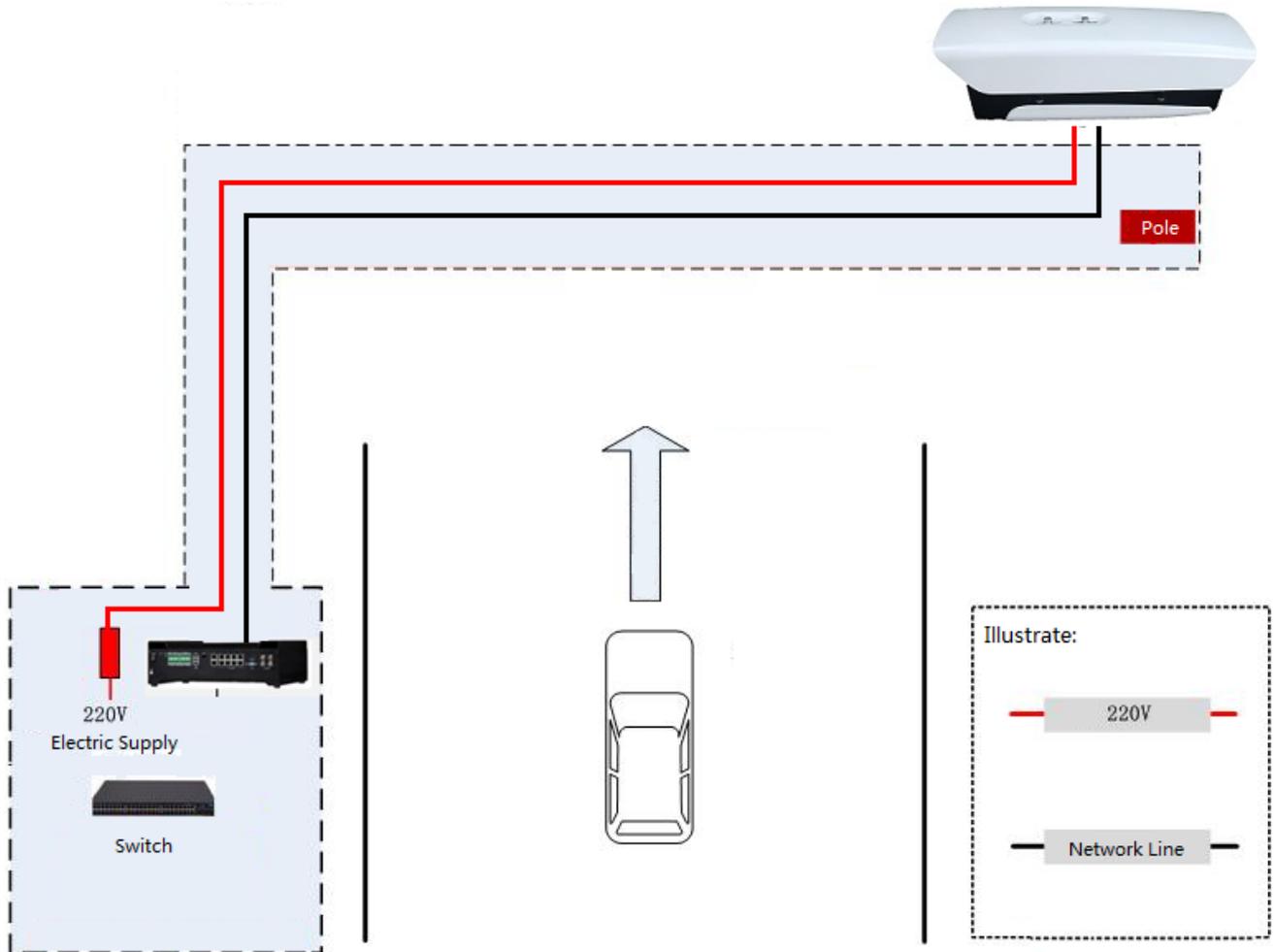


Figure 3.1-1

Note: please set wiring according to protect condition, and increase and decrease of wire are allowed.

3.1.2 System Device Wiring Disassembly

3.1.2.1 Camera Power Wiring

Camera adopts 220V, 12V or POE available, within housing it has city grid to 12V adaptor.

Note: If you need 12V power or POE, light board power supply end needs to be synced to camera or POE 12V power supply end by adaptor.

Power line, from cabinet to all-in-one housing, adopts RVV3*1.5² cm cable, please see Figure 3.1-2:

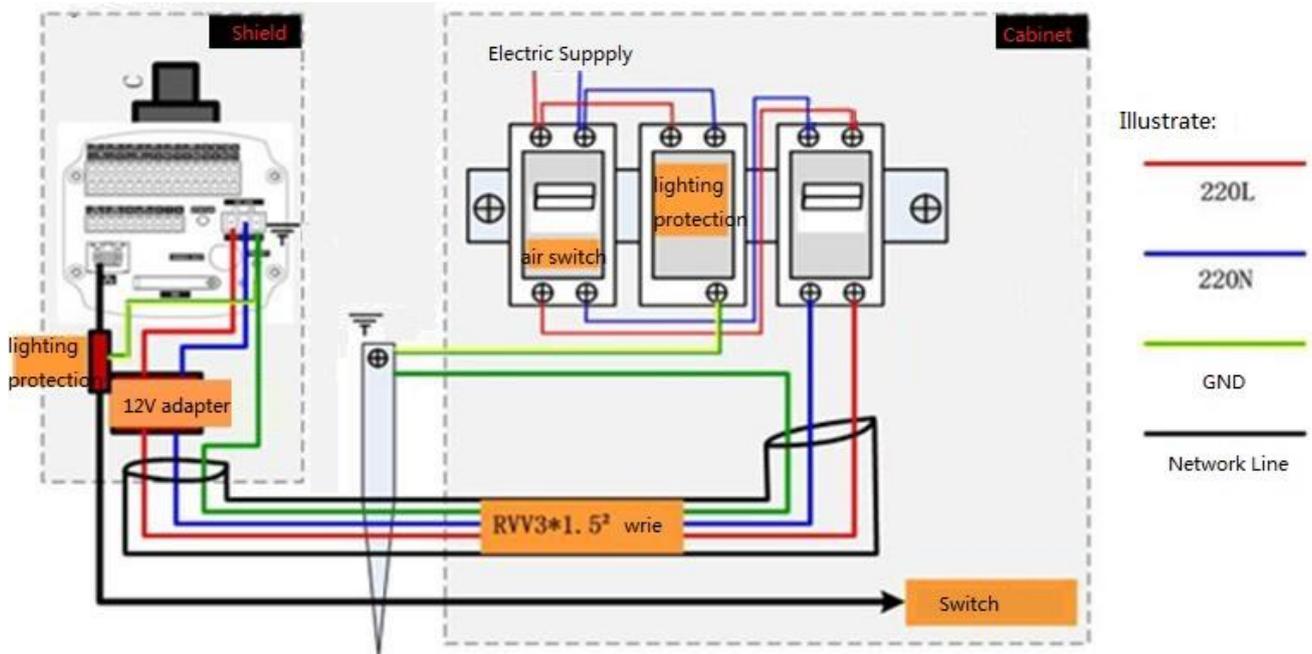


Figure 3.1-2

Chapter 4 System Debugging

4.1 Debug Camera

4.1.1 HD Camera Scene Requirement

Scene adjustment steps and requirements (example of vehicle hear, see Figure 4.1-1) :



Figure 4.1-1

- Snapshot at distance of 22 meters to the lower 1/3 part of scene (or 1/4) ;
- Cover 2 or more vehicles, best to cover whole part of a bus;
- After host upper and lower scenes are adjusts, you can adjust left and right scenes.

4.1.2 Adjust Camera Focus

Adjust focus and requirements:

- Adjust focus only when camera is well installed and senesce is adjusted.
- Use a PC to log in camera Web, and switch to Live interface to observe effect of video.
- **Manually adjust to max iris**, adjust rotate focus until video it clear by giving priority to plate clarity.
- Click  at the upper right corner, to optimize details.

Chapter 5 India Plan

Through on-site testing, the device must recognize vehicle, motor and TUTU at the same time.

Installation plan and light cup angle chart:

By default 4 light cup angles are 30° at 6m height and 22m distance. If you have special requirements, please refer to the following chart to select snapshot distance and light cup angle (gran plan not recommended).

| | | | | | | |
|--|------|------|------|------|------|------|
| Installation height (m) | 4 | 4 | 4 | 4 | 4 | 4 |
| Horizontal snapshot distance (m) | 6 | 10 | 15 | 20 | 25 | 30 |
| Recommended fill light angle (10% light intensity angle) | 73.0 | 52.7 | 37.9 | 29.3 | 23.8 | 20.0 |
| Light cup angle (°) | 80 | 60 | 40 | 30 | 30 | 30 |

Chart 5.1-1

| | | | | | | |
|--|------|------|------|------|------|------|
| Installation height (m) | 6 | 6 | 6 | 6 | 6 | 6 |
| Horizontal snapshot distance (m) | 6 | 10 | 15 | 20 | 25 | 30 |
| Recommended fill light angle (10% light intensity angle) | 64.3 | 49.2 | 36.5 | 28.7 | 23.4 | 19.8 |
| Light cup angle (°) | 60 | 60 | 40 | 30 | 30 | 30 |

Chart 5.1-2

Here is a recommended plan, see Figure 5.1-1.

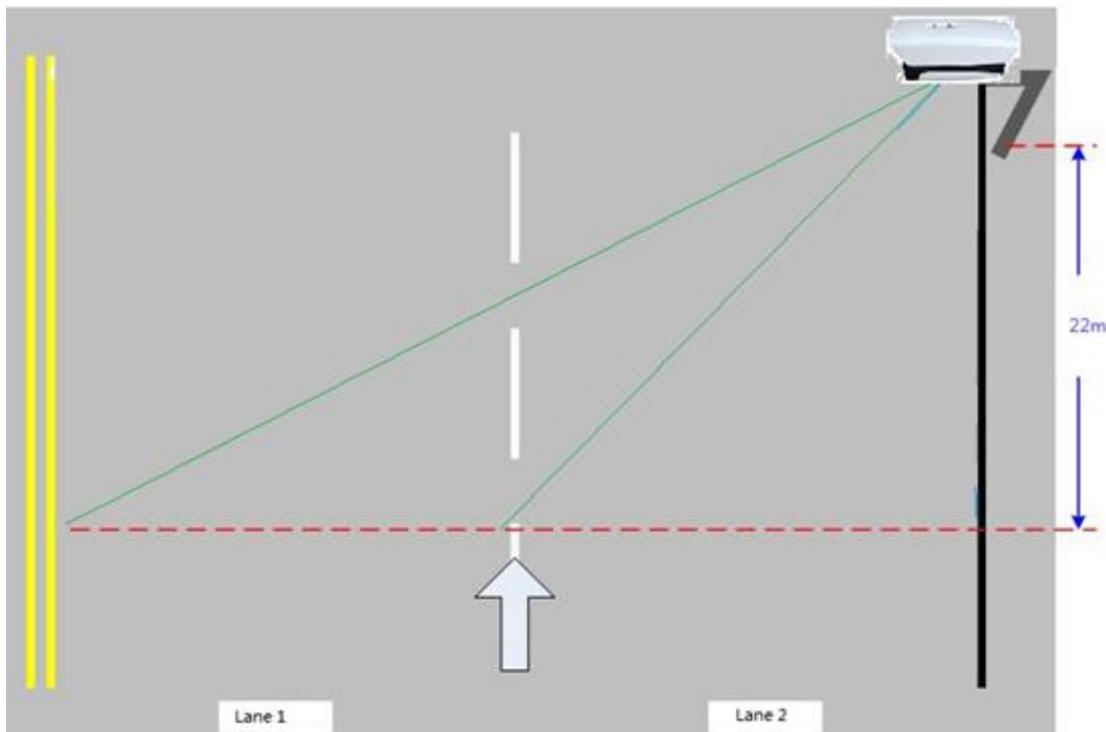


Figure 5.1-1

Pole and device installation distance note:

- Snapshot distance: 22 meters;
- Camera installation height: 6 meters;
- The limit of side install is the 2nd lane, not 3rd lane since its side installation is too big, cannot be detected.
- Advantage and disadvantage

Advantage:

- ① Image effect, tails of large, small vehicles or motor are 90% clear;
- ② Compare to vehicle head plan, this plan largely improves recognition of motor plan, especially at night time from 40% to 70%.

Disadvantage: Compare to vehicle head plan, this plan cannot get face details of driver, so lose partial vehicle info.

Tail plan motor effect at night:



2018-01-13 19:04:53.683 South To North
reg-null Vehicle Body: Black Vehicle Sign: Other Vehicle Type: Motor No CarLength No Speed Trigger Source: Video
Certificate: Checkup Period Of Validity: 2013-01-09 - 2013-01-09 Checkup Unit: SerchAddress: Counterfeit: fffhjkp5VivL1KzX



Figure 2.1-3

Partial effect:



Figure 2.1-4

Attached Jan.12th algorithm test result:

- ① Day time vehicle head, capture rate, vehicle67.8%, non-vehicle70.1%, total capture rate: 68.6%; actual recognition rate 92.9%; LOGO: 30%; model: 57%, vehicle color: 74.75%;
- ② Night vehicle head, capture rate, vehicle41.5%, non-vehicle14.9%; actual recognition rate83.5%;
- ③ Day time vehicle tail, capture rate: motor: 82.4%, non-vehicle94.6%, total capture rate: 87.6%; actual recognition rate: 88.5%; LOGO33.8%, model: 75%, vehicle color: 81.6%;
- ④ Night vehicle tail, capture rate, vehicle86.6%, non-vehicle83.5%; actual recognition rate75%。

Chapter 6 FAQ

| FAQ | Solution |
|---|--|
| Device is abnormal, cannot boot up or be operated | Device is abnormal and cannot operate or cannot boot up, press Reset key for 5 seconds to restore default settings. |
| WEB control unit did not pop up webrec.cab | Please lower Internet Explorer security level to the lowest, set “ActiveX plug in and control unit” to “enabled” . |
| Focus not clear at night | At day time, manually adjust iris to max, and manually focus or use ABF (do not touch ABF during other time) |
| Plate effect is weak at night | <ol style="list-style-type: none"> 1. Confirm focus clarity; 2. At night, use linear WDR; (adjust WDR to below 50 at night, default is OK) 3. Ensure use of IR7 on site, light cup angle is 15 degrees。 |
| Snapshot rate is low at night | <ol style="list-style-type: none"> 1. Recommend vehicle tail snapshot plan; 2. Ensure snapshot effect is ok; 3. Use version after Jan.12th . |