Multi-spectral PTZ Camera

Quick Start Guide

V1.1.0

Preface

Below is about the correct usage method for the product. To prevent danger and avoid property damage, please carefully read this guide before using the device and strictly abide by it during use. After reading, please keep the guide properly.

Overview

This guide applies to the multi-spectral PTZ camera.

This guide describes the installation steps and precautions as well as basic operations of the multi-spectral PTZ camera.

Symbol Conventions

Below are descriptions for symbols in this guide.

Description	Descriptive text emphasizes and supplements the content in the main body.
Caution	Caution text indicates potential risks. Ignoring such text may result in device damage, data loss, device performance degradation, or unpredictable results.
Warning	Warning text indicates low to moderate potential danger. Ignoring such text may lead to injury accidents, device damage, or business interruptions.
Danger	Danger text indicates high potential risks. Ignoring such text may cause injuries, deaths, or other major dangers.

Important Safety Instructions

During the installation and use of the product, it is essential to strictly adhere to various local electrical safety standards.

Warning

● Please use the power adapter provided by regular manufacturers. Before operating the device, check whether the power supply is correct (refer to the device label for power supply requirements).

● Please install user-friendly power-off devices during wire installation to enable emergency power-off if necessary.

● Please protect the power cord from being stepped on or crushed, especially at the plug, power socket, and the contact points from the device.

● When the product is installed on a wall, make sure it is securely fixed.

● If the product fails, please contact the seller or manufacturer. Do not disassemble or modify the product in any way (the Company is not responsible for issues caused by unauthorized modifications or repairs).

Caution

● Do not place the device in damp, dusty, extremely hot or extremely cold sites with corrosive gas or unstable lighting conditions.

● Please transport, use, and store the device within the allowed humidity and temperature range.

● Avoid aiming the lens at high light sources (such as the sun or lasers) to prevent image sensor damage.

● Please pack the device for transport in its original packaging or equivalent material.

● Do not subject the device to heavy pressure, severe vibrations, or immersion during transport, storage, or installation.

● It is recommended to use a lightning arrester with this device to enhance lightning protection.

● Clean the device body with a soft and dry cloth. For stubborn dirt, gently wipe it off with a clean and soft cloth with a small amount of neutral detergent, and then dry up. Do not use volatile solvents such as ethanol, benzene, or diluents, or strong and abrasive detergents, as this may damage the surface coating or degrade device performance.

● The lens hood is an optical component. Do not touch or wipe the surface directly during installation and use. If it is contaminated with dust, gently wipe it off with an oil-free soft brush or air blower. If it is contaminated with grease or fingerprints, use a soft cloth to gently wipe off water droplets or oil and dry up. Then, use an oil-free cotton cloth or lens cleaning paper dipped in lens cleaner to wipe outward from the center of the lens repeatedly until it is clean.

● Immediately change the default password after logging into the device to prevent account theft.

● Please use accessories or attachments specified by the manufacturer and have them installed and repaired by professional service personnel.

Instruction

● Quality requirements for installation and maintenance personnel

Qualification certificate or experience in video monitoring system installation and maintenance, including qualifications for relevant work such as aerial work operations, as well as the following knowledge and operating skills:

Basic knowledge and installation skills of video monitoring systems and their components;

Basic knowledge and operating skills in low-voltage wiring and low-voltage electronic circuit connection;

Basic network security knowledge and skills and ability to understand the content in the guide.

● Requirements for lifting devices

Use safe lifting devices suitable for the installation site and product installation method;

Lifting devices shall have adequate lifting height to reach the installation position.

Lifting devices shall have excellent safety performance.

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1. Product Introduction

1.1. Product Appearance

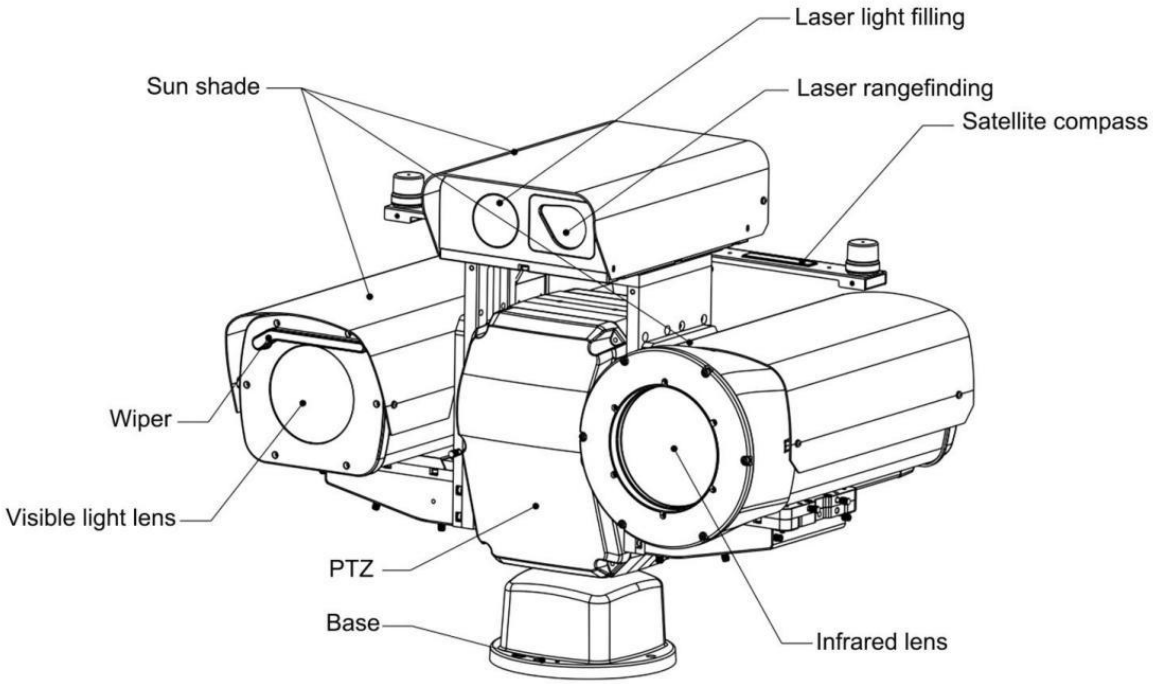


Figure 1.1 Appearance and Interface of Multi-spectral PTZ Camera

1.2. Cable Description

The cable interfaces include power interface, alarm interface, audio interface, RS-485 interface, network interface, etc. The interface description is as follows.

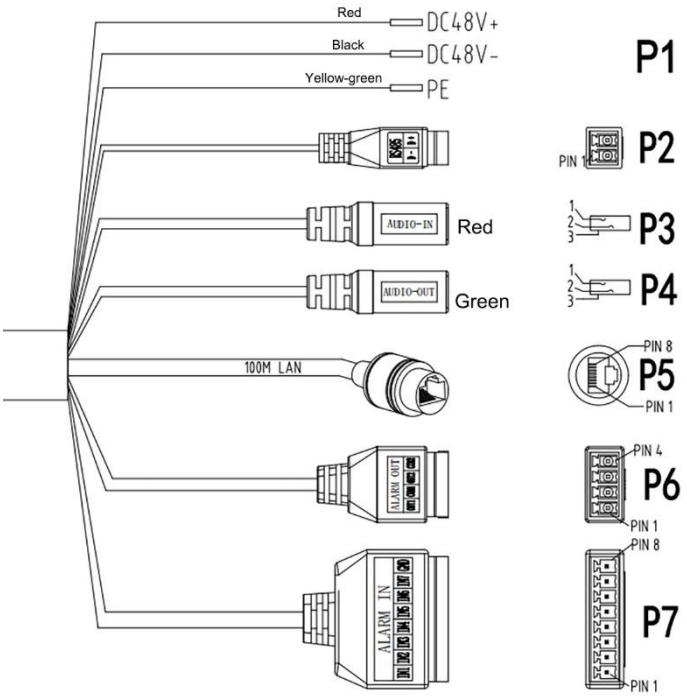


Figure 1.2 Cable Description

- P1 power interface (DC48V): supporting DC48V DC power, with PE as the ground wire
- P2 RS-485 interface (485): RS485 interface for controlling the PTZ.
- P3 audio input (AUDIO IN): inputting audio signals, externally connected with the pickup, etc., used to receive linear analog audio signal for sound collection.
- P4 audio output (AUDIO OUT): outputting audio signals to speakers and other devices for sound output.
- P5 network interface (LAN): outputting network signals, and connected with standard Ethernet cables.
- P6 alarm output (ALARM OUT): outputting alarm IO signals to the alarm device.
- P7 alarm input (ALARM IN): receiving IO signals from the external alarm source.

1.3. Alarm Interface Wiring Instructions

The device can be connected to alarm IO input and IO output (without voltage). An external power supply is required for connecting the alarm. The specific wiring method is shown in the figure below.

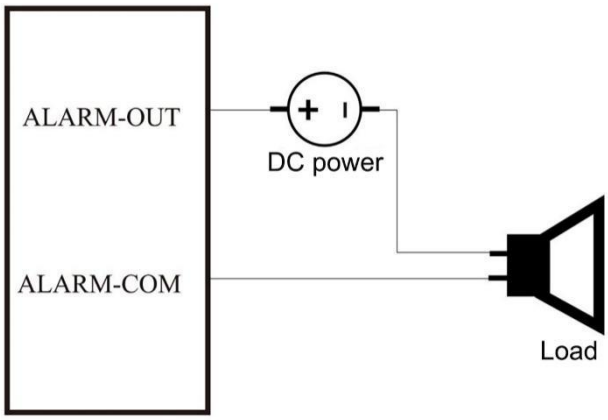


Figure 1.3 Schematic Diagram of Alarm Output Wiring

2. Product Installation

2.1. Instructions Before Installation

● Before installation, please confirm that the device in the package is intact and all parts are complete.

● Before installing the PTZ, please prepare in advance the tools and cables that may be needed for installation.

● Drill four mounting holes at the installation site according to the hole positions shown in Figure 2-1.

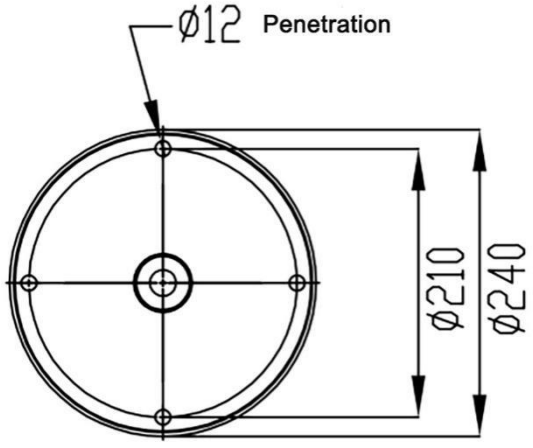


Figure 2.1 Installation Dimensions of PTZ

2.2. Suggestions on Monitoring Distance

The electric focusing lens or continuous zoom lens is adopted for the thermal imaging channel of the device. Before installation, please select the corresponding installation position and focal length according to the monitoring requirements for monitoring. The comparison of lens focal length and monitoring distance is shown in the following table.

Table 2.1 Detection, Recognition, and Identification Distances

Pixel Pitch /μm	Focal Length/mm	Detection Distance/km (Vehicle)	Detection Distance/km (Person)	Recognition Distance/km (Vehicle)	Recognition Distance/km (Person)	Identification Distance/km (Vehicle)	Identification Distance/km (Person)
12	225	28.8	9.4	7.2	2.3	3.6	1.2
	350	44.7	14.6	11.2	3.6	5.6	1.8
8	225	43.1	14.1	10.8	3.5	5.4	1.8
	350	67.1	21.9	16.8	5.5	8.4	2.7
15	660	67.5	22	16.9	5.5	8.4	2.8
	1100	112.4	36.7	28.1	9.2	14.1	4.6

● Assuming that the weather is clear and the atmospheric visibility is normal without obvious fog or haze, the probability of identifying the target at a specified distance is 50%.

● Assuming that the human target is 0.5m wide and 1.8m high, and the critical dimension is 0.75m; assuming that the vehicle is 4.0m wide and 1.4m high, and the critical dimension is 2.3m.

● According to the Johnson criteria for infrared images, it is assumed that:

The detection target needs to be imaged with not less than 1.5 pixels in the critical direction.

The recognition target needs to be imaged with not less than 6 pixels in the critical direction.

The identification target needs to be imaged with not less than 12 pixels in the critical direction.

● The actual detection distance varies with the setting of thermal imaging equipment, environmental conditions, user experience, monitor, or display type.

2.3. Cable Wiring

Due to the diverse environments and positions for PTZ installation, it is necessary to survey and plan wiring. Then you can wire precisely to provide safe and stable power supply and wiring to the PTZ. Adhere to the following suggestions during cable wiring planning.

● Before cable wiring, familiarize yourself with the installation environment, including wiring distances, environmental considerations, and avoidance of magnetic interference.

● Choose the PTZ operating cables with a rated voltage higher than the actual voltage to ensure that PTZ

can operate normally under unstable voltage.

● To avoid wire breakage and disconnection, it is better to wire the PTZ with one separate cable. If conditions are limited, protect and reinforce wire connections to prevent device malfunction from aging circuits.

● Reinforce protection for power cables and signal transmission lines. Pay attention to securing and safeguarding the wiring during implementation to prevent monitoring failures due to sabotage.

● Avoid excessive redundancy or taut cables during wiring.

PTZ cable wiring is operated by qualified personnel with professional skills. While you may not need extensive knowledge, you can troubleshoot issues related to PTZ failures from the above aspects.

2.4. Lightning Protection Instructions

This product features plate electrode lightning protection technology, which can effectively prevent damage to the device caused by instantaneous lightning strikes and surges. However, additional lightning protection measures such as external lightning arresters shall be taken when the device is installed at a high place.

- Lightning arrester specification requirements: The rated voltage shall be DC48V, and nominal discharge current is recommended to be at least 10KA.
- Signal transmission lines must be kept at least 50m away from high-voltage equipment or cables.
- Outdoor wiring should be routed under the eaves as much as possible.
- For open areas, sealed steel pipes must be buried for wiring, and single-point grounding method must be applied to the steel pipes. Overhead wiring is strictly prohibited.
- For outdoor installation, necessary protective measures must be taken according to the actual situation on the premise of ensuring electrical safety, and power supply lightning arresters should be installed when necessary.
- In regions prone to severe thunderstorms or high induced voltage, such as high-voltage substations, measures such as installing additional high-power lightning protection equipment and lightning rods must be taken.
- The lightning protection and grounding of outdoor devices or cables must be designed in combination with the lightning protection requirements of buildings and meet the requirements of relevant national standards and industry standards.
- The system must be equipotentially grounded. The grounding device must meet the dual requirements of system anti-interference and electrical safety, and shall not be short-circuited or interconnected with the neutral line of the strong power grid. When the system is grounded separately, the grounding impedance shall not be greater than 4Ω, and the cross-sectional area of the ground wire must be greater than or equal to 25mm².

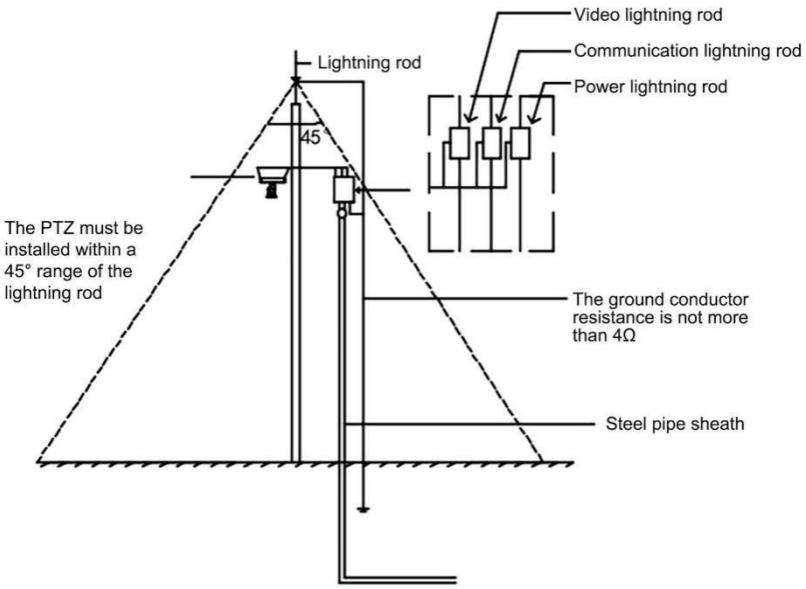


Figure 2.2 Installation Dimensions of PTZ

2.5. Installation Guide

Unlike other cameras, PTZ is heavy and has a high demand on stability and weight capacity of the supporting structure. Hence, it is usually recommended to install it directly on the base to minimize safety risks.

If a mounting bracket must be used, design it based on the PTZ base diagram, considering factors such as weight capacity and anti-vibration to ensure that the bracket is secure and the image is smooth.

2.6. PTZ Installation

Step 1 Unpack the PTZ and take out the PTZ and its corresponding screws and other accessories.

Step 2 Lead out the connecting cables of visible light pod and infrared pod from the base wiring trough.

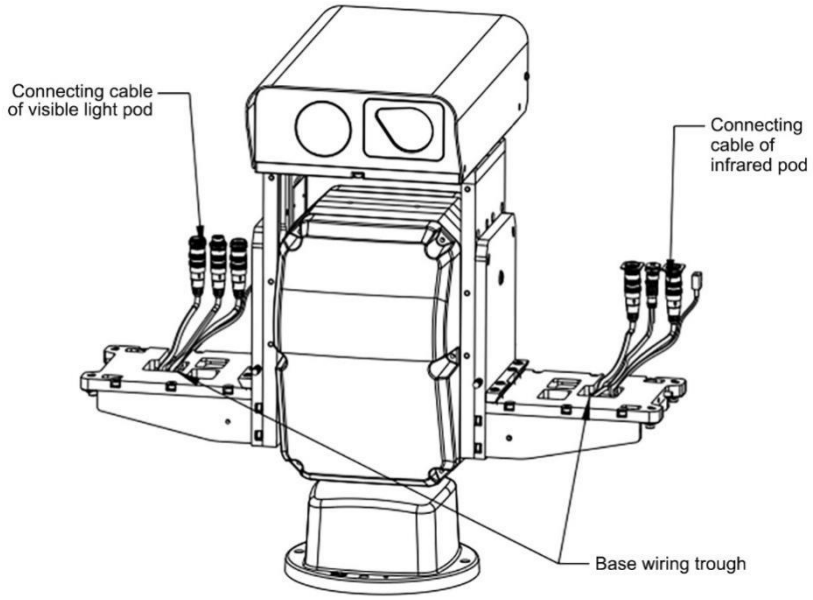


Figure 2.3 Cable Arrangement

Step 3 Install sun shades for the visible light pod and infrared pod.

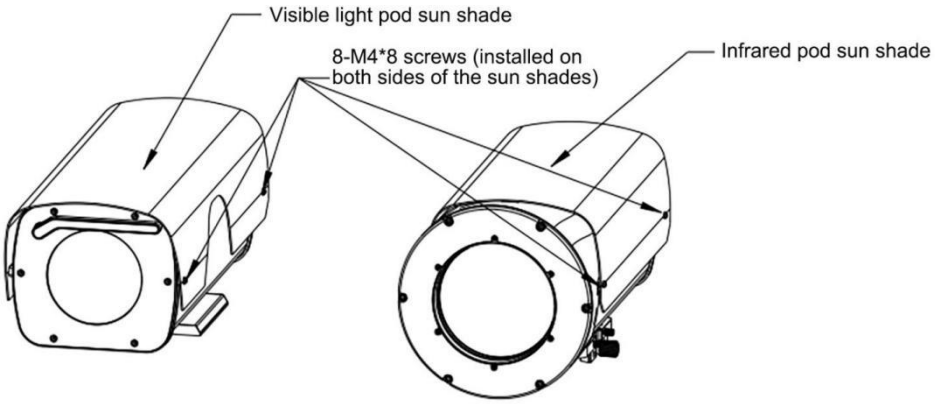


Figure 2.4 Fixing Sun Shades

Step 4 Install the visible light pod and infrared pod. According to the trajectory shown in the figure, align the location columns, then tighten the hand screws of the visible light pod and infrared pod by hand respectively, and finally secure the M6*25 screws.

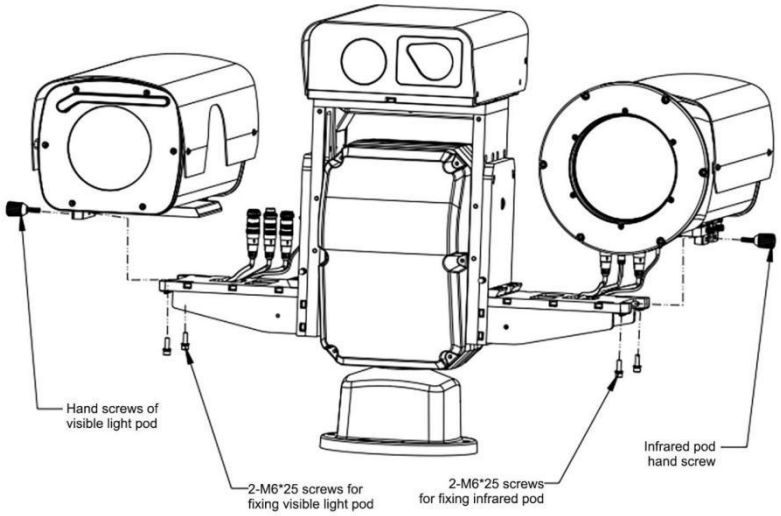


Figure 2.5 Fixing Infrared Pod and Visible Light Pod

Step 5 After the infrared pod, visible light pod and PTZ cables are connected, fix the rear cable covers for infrared pod and visible light pod respectively. Then tighten the hand screws to fix the wire shields of infrared pod and visible light pod.

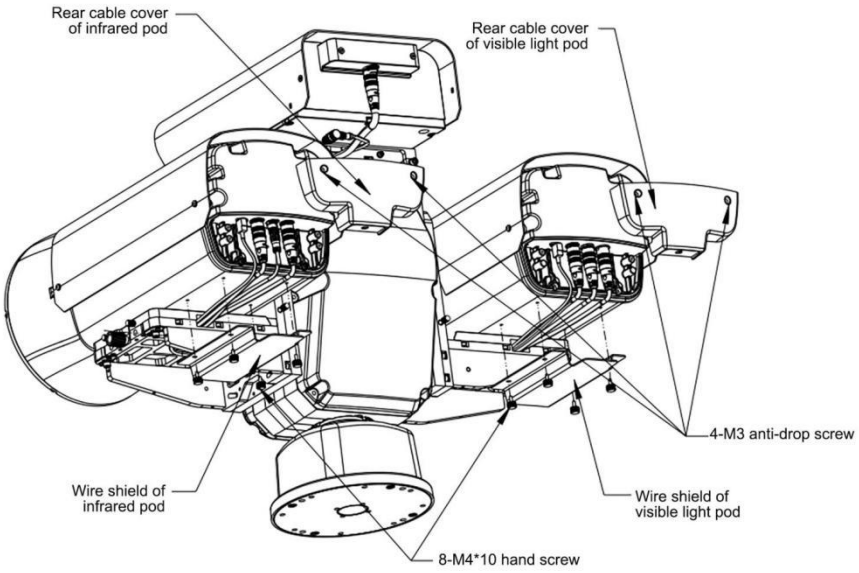


Figure 2.6 Connecting Cables and Wire Shields

Step 6 Fix the satellite compass and connect the cables. Then connect the top pod and PTZ cables, install the top pod rear cover, unscrew the safety lock pin at the bottom of the visible light, and install the PTZ wire shields on both sides with M4*10 screws.

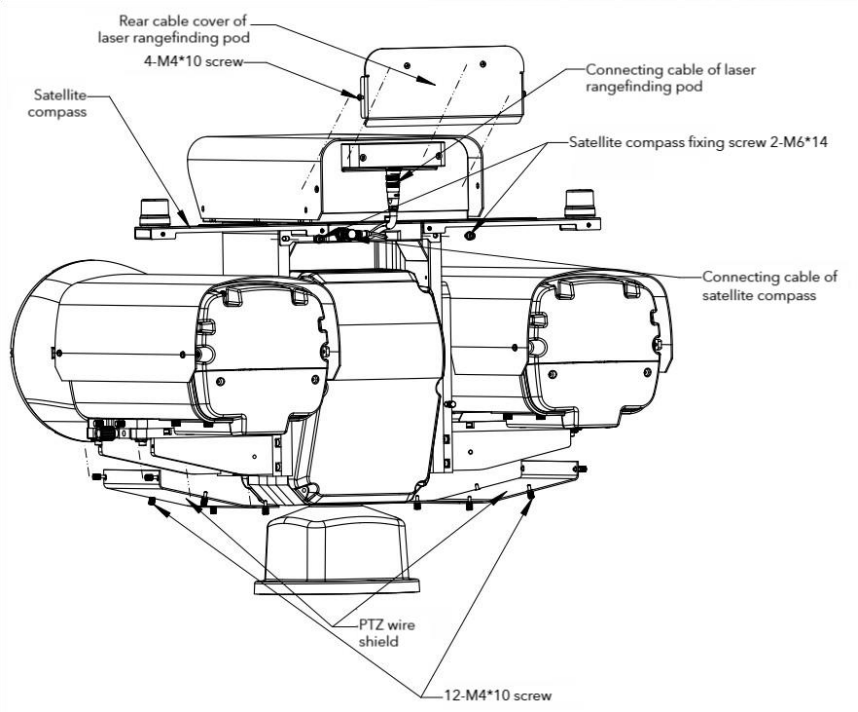


Figure 2.7 Installation of Satellite Compass and Top Pod

Step 7 Installation complete. Before using the PTZ, please unlock the travel lock. The unlocked position is with the lock handle pointing forward, and the locked position is with it pointing backward.

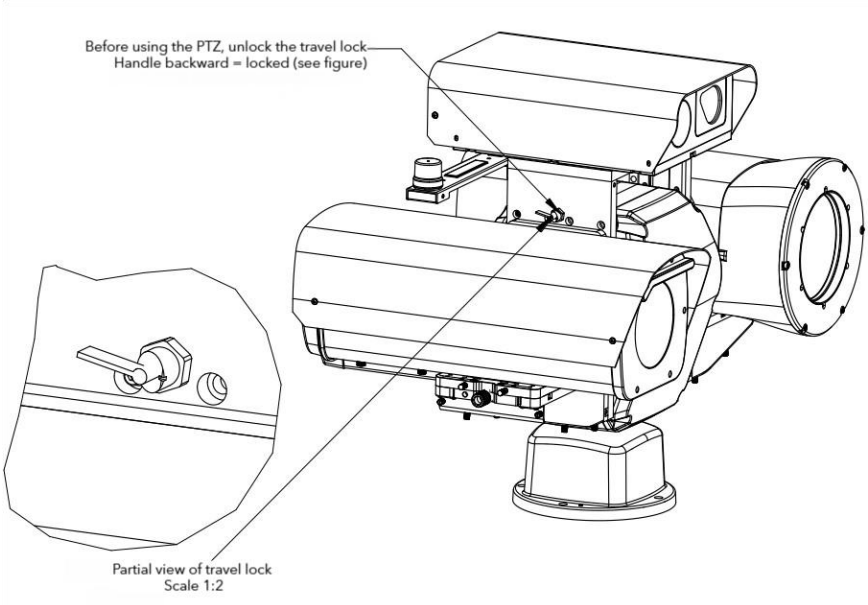


Figure 2.8 Installation Completion

2.7. Installation of Protective Sleeve for Interface

When using the device, install the supporting waterproof sleeve for the interface to avoid water ingress into the network cable as required. The waterproof sleeve for the interface is installed as follows.

Step 1: Thread the network cable through the fastening nut and waterproof sleeve body in turn.

Step 2: Cut off the waterproof rubber ring and sleeve it into the network cable between the waterproof sleeve body and the fastening nut.

Step 3: Sleeve the O-ring into the interface and insert the network cable into the interface.

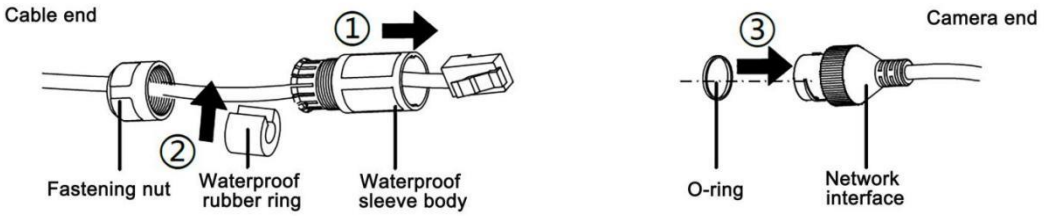


Figure 2.9 Installation of Network Cable

Step 4: Align the interface notch with the buckle of the waterproof sleeve body, fit the waterproof sleeve body into the interface end, and tighten it clockwise.

Step 5: Insert the waterproof rubber ring into the waterproof cap body.

Step 6: Rotate the fastening nut clockwise to compress the waterproof rubber ring.

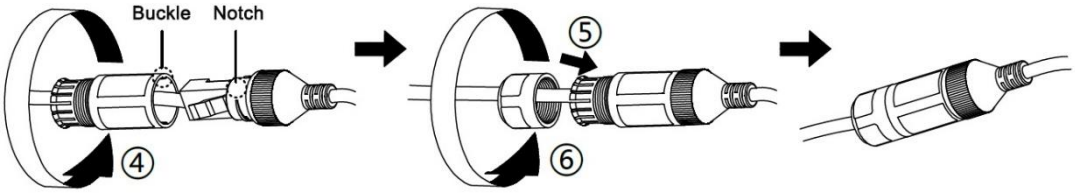


Figure 2.10 Installation Completion

3. Operation Guide

3.1. Preparations

Step 1 The default IP address of the device upon delivery is 192.168.1.123;
Step 2: The subnet mask is 255.255.255.0, and the IP address of the device can be modified. For example, change the device address to 192.168.1.194, and your computer IP address to the same network segment as the network video server with the same subnet mask, such as 192.168.1.120;
Step 3: Test whether the device starts normally. In WINDOWS, execute <Start→run→cmd> operations to open the command line window, and enter Ping 192.168.1.123 in the command window. If **Request time out** is not displayed, it indicates a normal start;
Step 4 Google, Firefox, Edge, etc. are supported.

3.2. Login

Step 1 Enter the IP address in the browser address bar to log in. The following login page will appear. You can switch languages on this page or on the main page after login. Simplified Chinese and English are available;

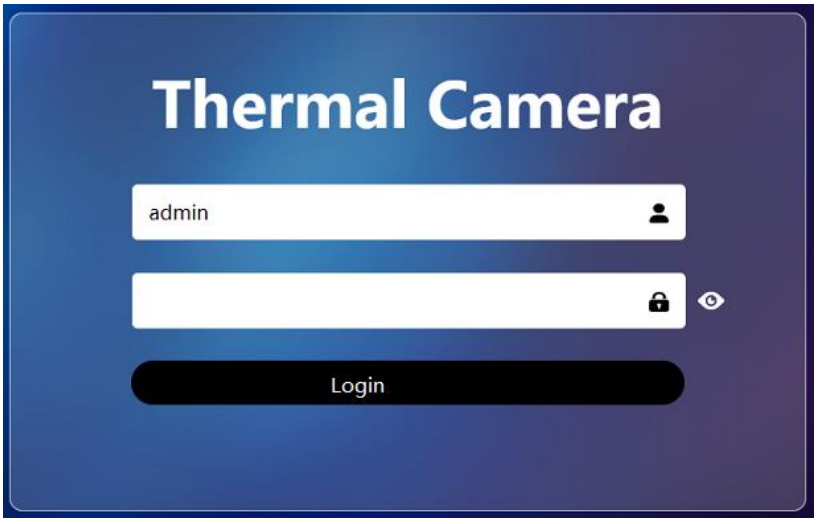


Figure 3.1 Login Screen

Step 2 For the first login, the default administrator username/password is: (admin/admin), and the password can be changed after login;
Step 3 Click **OK** to enter the video preview screen on the device Web side, as shown in the figure below:

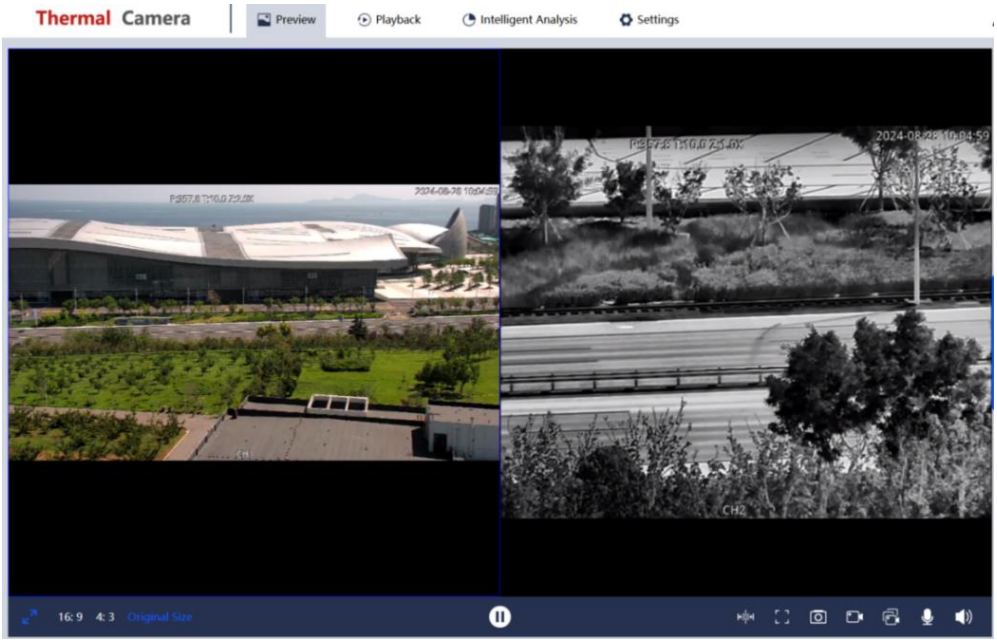


Figure 3.2 Preview Screen

3.3. Description of Home Screen

The home screen of the PTZ has system menu, video window adjustment, video window function options, PTZ configuration, PTZ settings, etc. For details, please refer to the web instructions.

Appendix A Installation and Maintenance

Lens Maintenance

The lens surface is coated with anti-reflection coating film. When it is stained with dust, grease and fingerprints, harmful substances will be generated, resulting in performance degradation or scratches, mildew, etc. In case of dirt, please handle it as follows.

1. Dust stain: Use an oil-free soft brush or air blower to gently wipe it off.
2. Grease stain: Gently wipe off the water droplets or oil with a soft cloth and dry, and then wipe
3. outward from the center of the lens with an oil-free cotton cloth or lens cleaning paper dipped in alcohol or lens cleaner. If the grease is still not wiped clean, replace the cloth and wipe repeatedly for several times.

Network Security Maintenance

In order to ensure the network security of device, it is recommended to carry out regular network security assessment and maintenance. The Company can provide corresponding professional technical services.

Appendix B Common Substance Emissivity

Substance	Temperature (°C)	Emissivity
Water	0～100	0.95～0.98
Soil (dry)	20	0.92
Soil (wet)	20	0.95
Wood	17	0.962
Sand	20	0.9
Sandstone	19	0.909～0.935
PVC plastic	70	0.93
Asphalt	20	0.967
Paint	70	0.92～0.94
Wallpaper	20	0.85～0.90
Fabric	20	0.98
Concrete	20	0.92
Sidewalk pavement	5	0.974
Glazed porcelain	20	0.92
Ceramic tile	17	0.94
Gypsum	17	0.86
Brick	35	0.94
Ebonite	0～100	0.89
Carbon	20～400	0.95～0.97
Granite (rough)	20	0.879
Cold-rolled steel	70	0.09
Steel oxide	50	0.88
Copper	20	0.07
Copper oxide	50	0.6～0.7