

X-D535 People Counter Technical Specification



Wuhan X-Dynamics Co., Ltd

July, 2024

Change Record

Version	Revision Date	Revised Chapter	Revision History
V1.1.1	2025/01/21	All chapters	First Edition

Copyright Notes

Copyright ©Wuhan X-Dynamics Co., Ltd. All rights reserved.

Declaration of Secrecy

Information from this document (all attachments included) is confidential.

The recipient understand that the document is confidential, should neither use it for any other purpose beyond that allowed nor disclose it to any third party.

Contents

1. Primary Statement	4
2. Safety Instructions	4
2.1. Overview	4
2.2. Suitable for the Cloud	4
2.3. Electrical Connection	4
2.4. About Retrofitting	4
2.5. Anti-disassembly tips	4
2.6. Use Suggestion	5
3. Package Contents	5
4. Product Overview	5
5. Product Applications	6
6. Product Features	6
7. Technical Parameters	7
8. Product Profile drawing	8
9. Installation	9
9.1. Installation Points	10
9.2. Mounting Type	10
9.3. Heat Dissipation Requirement	11
10. Recommended Detection Range	11
11. Electrical Connection	12
11.1. Wiring and Interfaces	12
11.2. Connection Type	12
12. Maintenance and Repairs	13
12.1. Cleanliness	13
12.2. Firmware Updating	14
12.3. System Integration Guidance	14

X-D535 People Counter Technical Specification

1. Primary Statement

This document is intended for professional personnel got professional training or with rich practical experience, who are able to anticipate and avoid various risks and dangers during device operation and maintenance.

This document contains information about the correct operation of the device. Before using the product, familiarize yourself with the operating conditions, installation requirements, and operation process. During the usage period, please keep this document properly,so that you may read it at anytime when necessary.

2. Safety Instructions

2.1. Overview

This instructions are an integral part of the device. It includes text and detailed diagrams that precisely explain the correct operation of the device. Be sure to read these instructions carefully before installing or using the device.

Please follow the operating instructions. If the operation is not performed in accordance with the prescribed method of use, once the installation is improper or operation error occurs, safety of the operator and the machine may be seriously affected.

2.2. Suitable for the Croud

This instructions apply to authorized personnel under the EMC and low voltage directives. A qualified electrician should install and connect the unit to put it into service.

2.3. Electrical Connection

Disconnect the external connection of the device before operating it.

It can only be connected according to the interface pins described in the technical data, and power is supplied according to the output electrical indicators.

2.4. About Retrofitting

Any unauthorized modification of the unit may seriously affect the safety of the operator and the machinery. Please do not modify the device without authorization.X-Dynmmics rejects any liability or warranty claims arising from unauthorized modification.

2.5. Anti-disassembly tips

Do not remove the shell when the device is working.

Remove the device shell manually with careful touch to avoid damage to the device. This is a Class 1 product that may cause radio interference in living environments. In this case, the user may be asked to take actual action to combat the interference.

2.6. Use Suggestion

Camera usage recommendations:

- Remove the protective film in front of the lens when using the 3D camera;
- Keep the camera (especially lens position) away from heat source when installing or using it;
- When using the 3D camera, please avoid the lens of it being scratched by sharp objects;
- Avoid frequent use of alcohol (organic solvent) to wipe the lens surface, there is a risk of damage to the coating, it is recommended to wipe with a clean lint-free cloth;
- In the case of strong high-frequency vibration or external impact, please add appropriate protection conditions for the camera;
- In harsh environments such as excessive humidity or strong dust, please add appropriate protection conditions for the camera;
- Refer to the 3D camera installation instructions and avoid any installation method that may cause serious distortion of the camera.

3. Package Contents

- iToF People Counting Camera (x1)
- Certificate of Conformity (x1)
- Warranty Card (x1)
- Brief product manual (Please refer to our technical documents or other documents)

4. Product Overview

The X-D535 is an industrial camera based on the 3D iToF (indirect Time-of-Flight) technology solution.

The sensor emits the modulated near-infrared light which is reflected after encountering the object, calculates the phase difference between emission and reflection before transmit it

into a time difference to convert the distance of the shot scene, so as to forms depth information and finally present the object's three dimensional profile in topographic maps with different colors representing different distances.

The camera uses depth information, combined with algorithms, to track and count the human body in order to generate a count.

5. Product Applications

The X-D535 camera can be used in:

- Passenger flow statistics (applied to scenic spots, libraries, museums, restaurants, supermarkets,etc.);
- Intelligent transportation plan (applied to public transportation, buses, subways, etc.);
- Occupancy monitoring (used in smart toilet,etc.);
- Dwell time detection (applied to supermarkets, clothing stores, etc.);
- Employee identification

6. Product Features

- WIFI/ Ethernet communication modes are available
- The statistical accuracy rate is 98%
- Supports bidirectional traffic statistics, wandering filtering, and multiple-entry statistics.
- Support regional population statistics, and dwell time detection.
- Supports advanced features such as employee identification, distinguishing between adults and children.
- Quick Wi-Fi configuration.
- Supports multiple cameras in the same area. Comprehensive data can be obtained on the cloud platform for statistical analysis
- IP66 degree, stable operation in semi-outdoor environment such as eaves.
- Long battery life (1 to 3 months under 24-hour normal working conditions)
- Not affected by ambient light, day/night accurate detection.
- No video camera work, anonymous statistics without privacy risk.

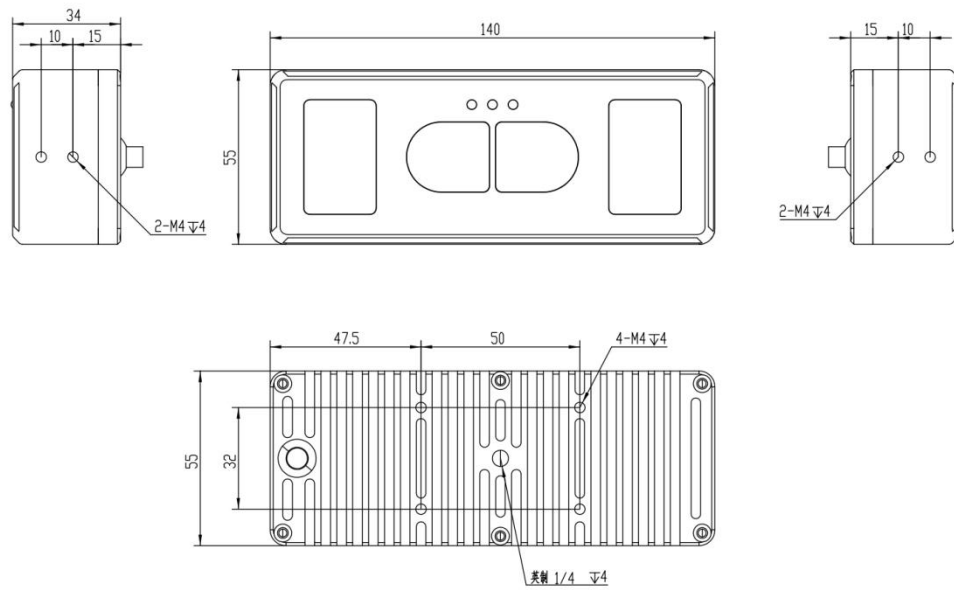
7. Technical Parameters

Performance index		Performance parameter
Accuracy rate		≥98%
Mounting height		2.4m~3.5m
ToF Tech	FOV	Verticality 98°x horizontality 80°
	ToF wavelength	940 nm
	Detection range	0.2~3.5m
Advanced Function	Bidirectional counting	Supported
	Wanderer filtration	Supported
	Multiple detection lines (Multiple entrances and exits)	4 custom irregular polylines.
	Regional people count	Supported, up to four detection areas can be drawn at the same time.
	Dwell time detection	Supported
	Employee identification	Supported, distinguished by employee tags on both shoulders/lanyards.
	Adult/child distinction	Supported
	Cascade splicing	Up to 8 devices are supported
	Heat map	Supported
	Classified counting	Supported
	Automatic installation height detection	Supported
	People counting data	1,000,000 records.
	Video check	4 hours of video time.
	Automatic height compensation inder slanting installation	Supported by three-axis sensors
Wired connection	Receiver	8 user-defined MQTT/HTTP Receivers

Performance index		Performance parameter
	Disconnection data retransmission	8×50,000 back up data
	Ethernet port	10/100Mbps
	RS485	Industrial RS485 communication
	DI/DO	1/1(either-or)
Physical interface	Power input	1×DC5521 female terminal
	Net opening	1×RJ45
	Multi media interface	1×DI/DO(either-or) +1×RS485
	Indicator light	3 indicator lights
Periphery parameter	Power supply mode	802.3 at PoE power supply; 12 V/2.0 A DC power supply (DC female terminal with circular hole)
	Power consumption	Max. 14.31 W Avg. 7.45 W
	Sleep mode power consumption	4.55 W
	IP degree	IP66
	Relative humidity	0%~95% (No condensation)
	Operating temperature	-20°C ~ 50°C
	Size	140 × 34 × 55 mm
	Weight	419 g
	Installation	Ceiling installation, ceiling extension & door lintel installation (optional multi-functional support)

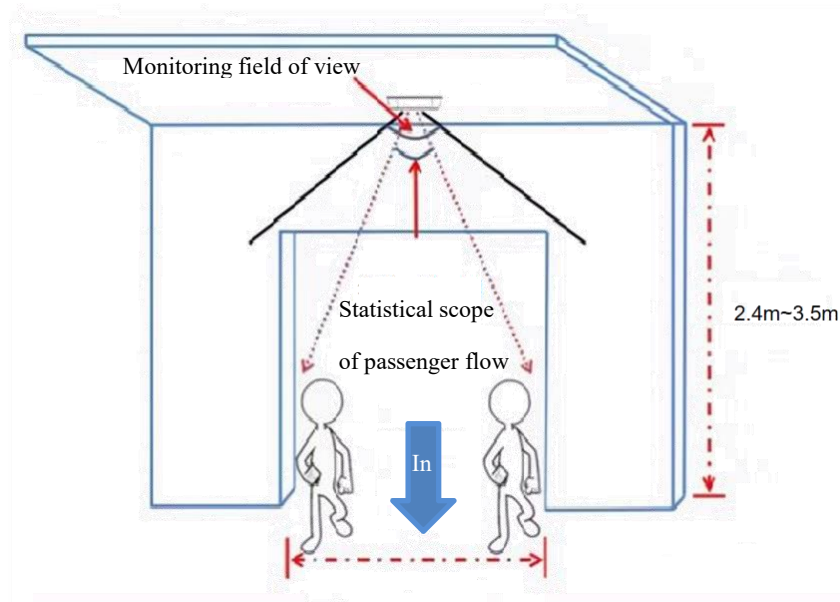
8. Product Profile Drawing

The product size information are as shown below:

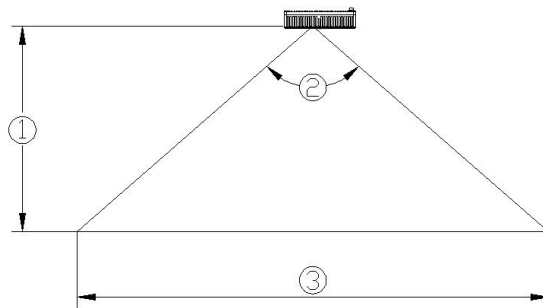


9. Installation

The equipment is easy to install and detection area definition supported, can be installed on the entrance door in office buildings, shopping malls, airports, subways, bus stations, toilets and other places with dense passenger flow. The recommended hanging height range is 2.4-3 meters, can be adjusted according to the actual situation.



9.1. Installation Points



- ① Working distance
- ② FOV (angle of field of view)
- ③ Field of view

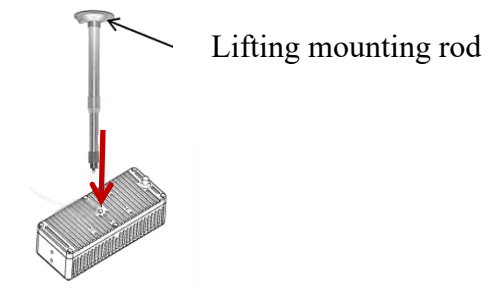
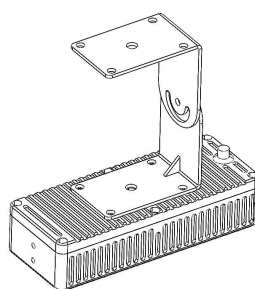
The installation instructions are as follows:

- (1) The device install height refer to ①, recommended 2.4m-3.5m;
- (2) The device FOV refer to ② is 98°x 80°;
- (3) Field of view refer to ③ in different working distance, pls see the recommended detection range table;
- (4) When requirement of field of view ③ was satisfied, the closer working distance①, the higher the precision and accuracy;

9.2. Mounting Type

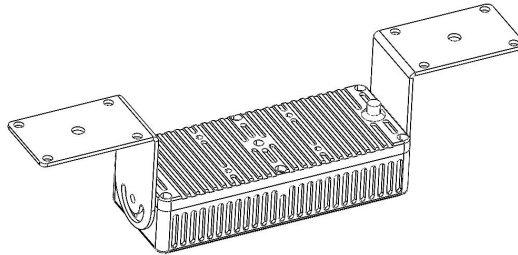
Mounting type options:

- ① There are four M4 and one inch 1/4 mounting holes in the rear side of the device. Using these holes, please select the appropriate installation accessories according to the application requirement to finish the installation.



- ② There are two M4 mounting holes in the side surfaces of the device. Using these

holes, please select the appropriate installation accessories according to the application requirement to finish the installation.



9.3. Heat Dissipation Requirement

Heat dissipation requirements:

- The device is a heat-generating one. Please maximize the heat dissipation conditions.
- The installation surface of the device should be in contact with metal parts to increase heat conduction and heat dissipation.
- Keep the installation near positions as empty as possible empty, to increase the heat exchange with the air;
- Do not pack the device when using it.
- The operating modes and parameters changing may increase the device surface temperature.

10. Recommended Detection Range

Installation height (m)	Field of view (m)
2.4	5.53 x 4.03
2.5	5.76 x 4.2
2.6	5.99 x 4.37
2.7	6.22 x 4.54
2.8	6.45 x 4.71
2.9	6.68 x 4.87
3	6.91 x 5.04
3.1	7.14 x 5.21
3.2	7.37 x 5.38
3.3	7.6 x 5.54

3.4	7.8 x 5.7
3.5	8.06 x 5.88
3.6	8.29 x 6.05
3.7	8.52 x 6.21
3.8	8.75 x 6.38
3.9	8.98 x 6.55
4	9.21 x 6.72

11. Electrical Connection

Follow these instructions to perform electrical installation.

- The camera must be connected by a qualified electrician, following electrical data requirements in technical documents.
- Cameras is with the protection level 111(PC111).
- Power supply can only be achieved through PELV circuits.
- Over-current protection device must be able to turn off 6A current within 120s. To find out the correct rating for over-current protection, consider the technical data for the camera and interfaces.
- The separation of external circuits must comply with UL61010-2-201
- If the cable length is less than 30m, use additional protection against surge voltage according to IEC 6100-4-5.
- Disconnect the power supply before connecting the camera.

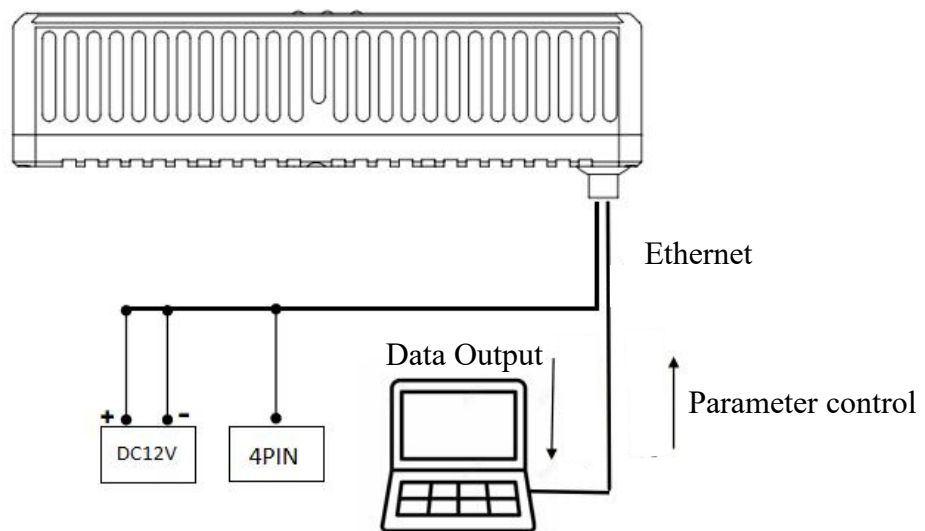
11.1. Wiring and Interfaces

Picture	Interface	Definition/ Uses
	RJ45	100 Mbit LAN /POE power supply
	DC5521 female terminal	DC power supply

	4PIN Terminal	Green PH3.5-4P; 1: DI_COM 2: DO_COM 3: RS485-A 4: RS485-B
---	---------------	--

11.2. Connection Type

The camera connection diagram is shown below:



12. Maintenance and Repairs

Please follow these instructions:

- Do not open the device as it does not contain any components that can be maintained by the user. The device can only be repaired by the manufacturer.
- Dispose of the equipment in accordance with national environmental protection laws and regulations.

12.1. Cleanliness

Before cleaning the camera, please make sure to follow these instructions:

- Use a clean lint-free cloth.
- Use dedicated glass cleaner.

If the instructions are not followed, scratches on the lens may cause measurement errors.

12.2. Firmware Updating

The camera's firmware can be updated via the web page. However, the parameters saved in the camera will be lost after the updating. Therefore, it is advised to back up the camera parameters before updating the firmware.

12.3. System Integration Guidance

Before using X-D535 iToF camera for development, please contact X-Dynamics staff to get technical specifications, user manuals, SDK files etc. Preliminary assessment, commissioning, verification and other steps can be processed to determine whether it meets the requirements of mass production.

Recommended process:

- Read the X-D535 specifications.
- Purchase and obtain X-D535 samples through official channels.
- Before development, please contact X-Dynamics staff to obtain the user manuals and other materials.
- During the product development based on functions, if with any questions, please timely contact with X-Dynamics staff.
- Determine the mass production proposal of the final product.