AI Stereo Vision People Counter

VS125

User Guide

Safety Precautions

Milesight will not shoulder responsibility for any loss or damage resulting from not following the instructions of this operating guide.

- The device must not be disassembled or remodeled in any way.
- To avoid risk of fire and electric shock, do keep the product away from rain and moisture before installation.
- Do not place the device where the temperature is below/above the operating range.
- **Do not touch the device directly to avoid the scalds when the device is running.**
- The device must never be subjected to shocks or impacts.
- Make sure the device is firmly fixed when installing.
- Do not expose the device to where laser beam equipment is used.
- Use a soft, dry cloth to clean the lens of the device.

Declaration of Conformity

VS125 is in conformity with the essential requirements and other relevant provisions of the CE, FCC, and RoHS.

Copyright © 2011-2024 Milesight. All rights reserved.

All information in this guide is protected by copyright law. Whereby, no organization or individual shall copy or reproduce the whole or part of this user guide by any means without written authorization from Xiamen Milesight IoT Co., Ltd.

For assistance, please contact

Milesight technical support:

Email: iot.support@milesight.com

Support Portal: support.milesight-iot.com

Tel: 86-592-5085280

Fax: 86-592-5023065

Address: Building C09, Software Park Phase III, Xiamen 361024, China

Revision History

Date	Doc Version	Description
Jul. 17, 2024	V1.0	Initial version

Contents

1. Product Introduction 5
1.1 Overview 5
1.2 Key Features 5
2. Hardware Introduction 6
2.1 Packing List 6
2.2 Hardware Overview 2
2.3 Button Descriptions 2
2.4 Dimensions (mm) 2
2.5 SIM Card Installation (Cellular Version Only) 3
3. Power Supply 4
4. Access the Sensor 4
5. Operation Guide 7
5.1 Dashboard 7
5.2 Rule 8
5.3 Communication 13
5.3.1 Network Configuration 13
5.3.2 Recipient & API 19
5.4 Report 23
5.5 Image 23
5.6 System 24
5.6.1 Device Info 24
5.6.2 User 25
5.6.3 Time Configuration 27
5.6.4 Remote Management 27
5.6.5 System Maintenance 28
6. Installation Instruction 29
6.1 Covered Detection Area 30
6.2 Installation 31
6.3 Factors Affecting Accuracy 34
7. Communication Protocol 34
7.1 Periodic Report 34
7.2 Trigger Report-Line Crossing People Counting 38
7.3 Trigger Report-Region People Counting 39
7.4 Trigger Report-Dwell Time Detection 41

1. Product Introduction

1.1 Overview

VS125 is a professional people counting sensor that is based on deep learning AI and Binocular Stereo Vision technology. This sensor possesses an impressive accuracy of up to 99.8% in people counting, and it delivers exceptional performance even in low light environment and total darkness. Besides that, it can achieve rich attributes recognition including gender and facial expressions. It is designed with privacy protection that complies with GDPR.

VS125 offers various connectivity options (Cellular and POE) for seamless connectivity and efficient space management across applications. Additionally, it provides rich interfaces for versatile connection options (RS485/DO/DI), expanding the possibilities for integration and customization. The VS125 can be easily installed, making it ideal in retail stores, malls, offices, subways, and other locations.

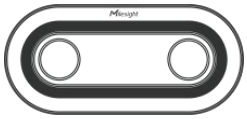
1.2 Key Features

- Up to 99.8% people counting accuracy with AI and stereo vision technology
- Great lighting adaptability that allows it to work well in low light environments and complete darkness
- With high ceiling mounting of up to 6m, support automatic tilt correction and automatic infrared light adjustment
- Customer-defined preview privacy settings, no data with personal information is transmitted, complies with GDPR
- Support line crossing people counting, regional people counting and dwell time detection
- Rich attribute recognition abilities including gender, facial expression (Under development), group counting (Under development), children & staff identification etc, provide deeper insights
- Support shopping cart counting with different fill levels (Under development)
- Support Heat Map function for foot traffic intensity and distribution analysis (Under development)
- Support Multi-Device Stitching which enables the linking of multiple devices, allowing for up to 8 device stitching to expand coverage (Under development)
- Support local data storage and data retransmission function for secured data collection
- Supports RS485/DI/DO multiple interfaces and has strong scalability
- Quick and easy management with Milesight Devicehub and Milesight Development Platform

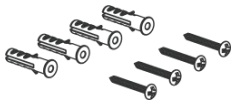
- High compatibility of data transmission with HTTP(s)/MQTT(s) protocol and API, supports customized push content and push method

2. Hardware Introduction

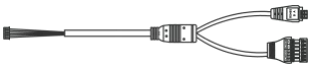
2.1 Packing List



1 × VS125 Device



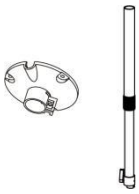
4 × Ceiling Mounting Kits



1 × Multi-interface Cable

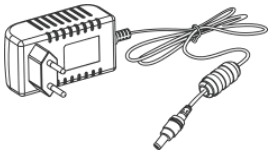
1 × Warranty Card

1 × Quick Guide



1 × VB01 Multifunctional Bracket Kit (Optional)

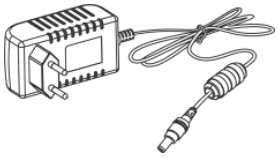
Cellular Version Only Accessories



1 x Power Adapter

1 x SIM-eject Tool

PoE Version Only Accessories

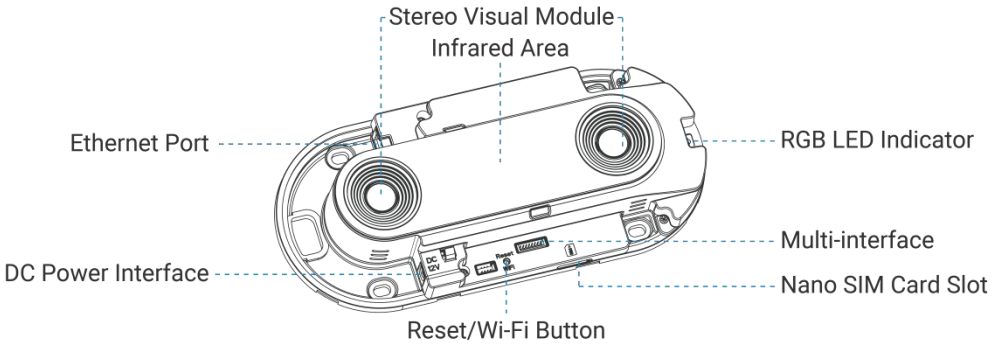


1 x Power Adapter (Optional)

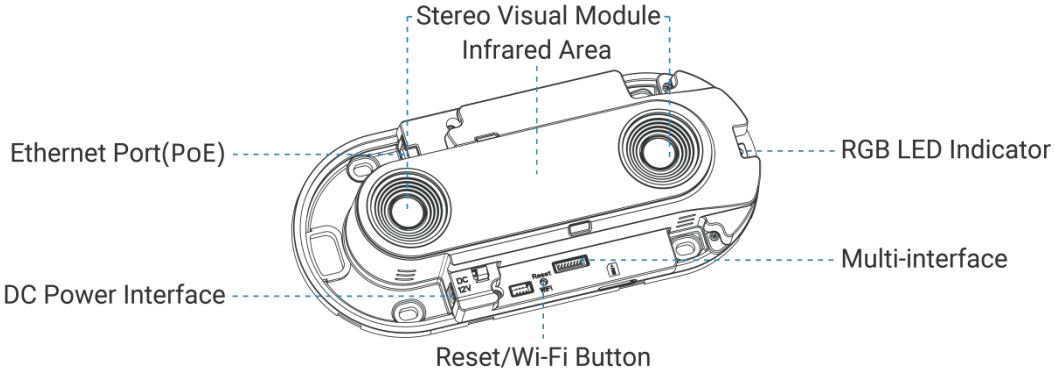
If any of the above items is missing or damaged, please contact your sales representative.

2.2 Hardware Overview

- **Cellular Version:**



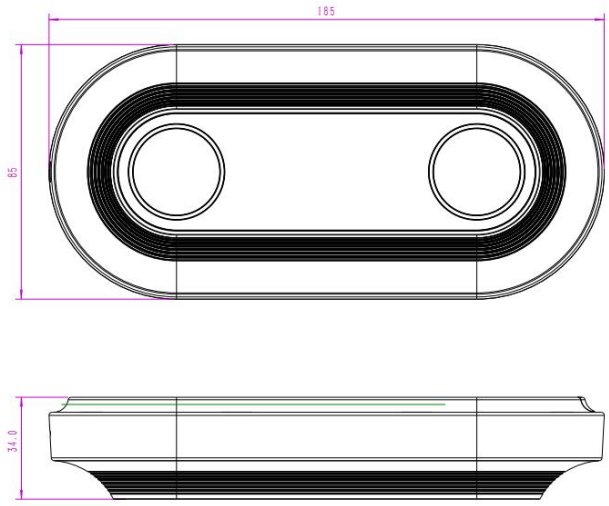
- **PoE Version：**



2.3 Button Descriptions

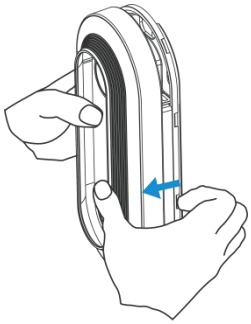
Function	Action	LED Indication
Turn On/Off Wi-Fi	Press and hold the power button for more than 3 seconds.	Turn On/Off: Blue light blinks for 3 seconds. Wi-Fi On: Blue light on. Wi-Fi Off: Green light on.
Reset to Factory Default	Press and hold the power button for more than 10 seconds.	Green light blinks until the reset process is completed.

2.4 Dimensions (mm)



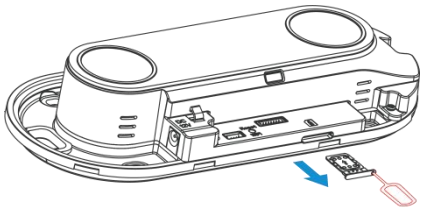
2.5 SIM Card Installation (Cellular Version Only)

Step 1: Remove the cover plate.



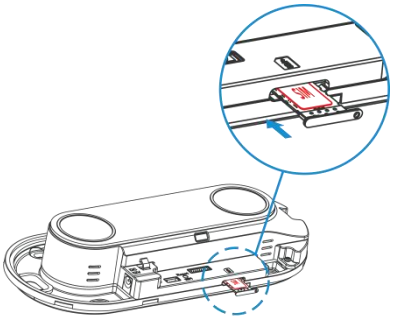
①

Step 2: Use the SIM-eject tool to pop open the SIM tray.



②

Step 3: Place the Nano SIM card into the sim card slot and insert it back to device.



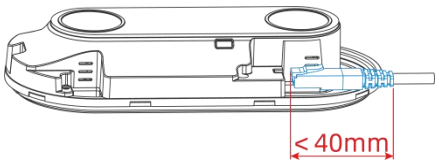
③

3. Power Supply

- **Powered by DC Power Adapter (12V, 1A)**

- **Powered by PoE Switch (PoE Version Only, 802.3af standard)**

Note: Ensure the length of the Ethernet Cable crystal head is less than 40mm.



4. Access the Sensor

VS125 provides user-friendly web GUI for configuration access via Wi-Fi or Ethernet port. Users need to customize the password when using the device for the first time. The default settings are as below:

Wi-Fi SSID: **People Counter_xxxxxx** (can be found on the device label)

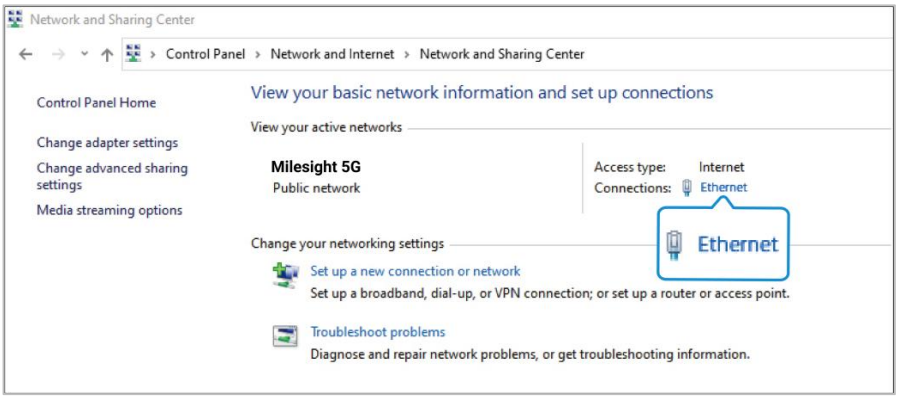
Wi-Fi IP: **192.168.1.1**

Ethernet IP: **192.168.5.220** (PoE Version Only)

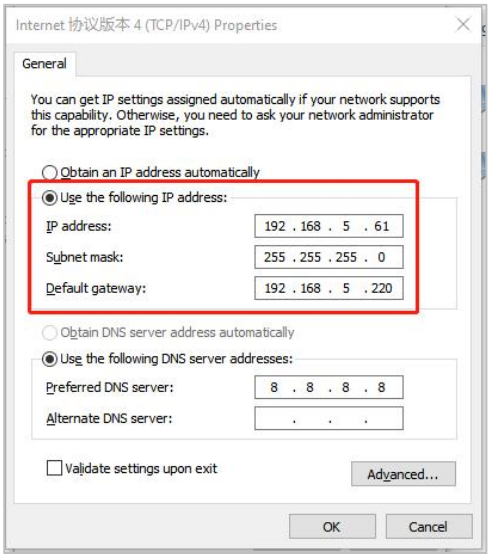
Step 1:

- **Wireless Method:** Enable the Wireless Network Connection on your computer, search for corresponding for Wi-Fi SSID to connect it, then type 192.168.1.1 to access the web GUI.
- **Wired Method (PoE Version Only)**: Connect the device to computer via Ethernet port, change the IP address of computer to 192.168.5.0 segment as below:

  a. Go to Start→ Control Panel→ Network and Internet → Network and Sharing Center→ Ethernet→ Properties→ Internet Protocol Version 4 (TCP/IPv4).



  b. Enter an IP address that in the same segment with sensor (e.g. 192.168.5.61, but please note that this IP address shall not conflict with the IP address on the existed network).

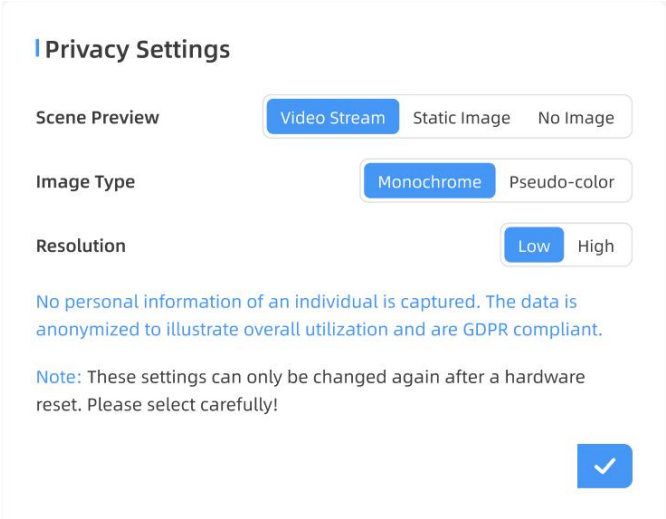


  Then open the Browser and type 192.168.5.220 to access the web GUI.

Step 2: Users need to set the password and three security questions when using the sensor for the first time.

Step 3: Configure the privacy settings to select preview image modes on the dashboard.

Note: If you need to reset the privacy settings, hold on reset button for 10s to reset device to factory default.

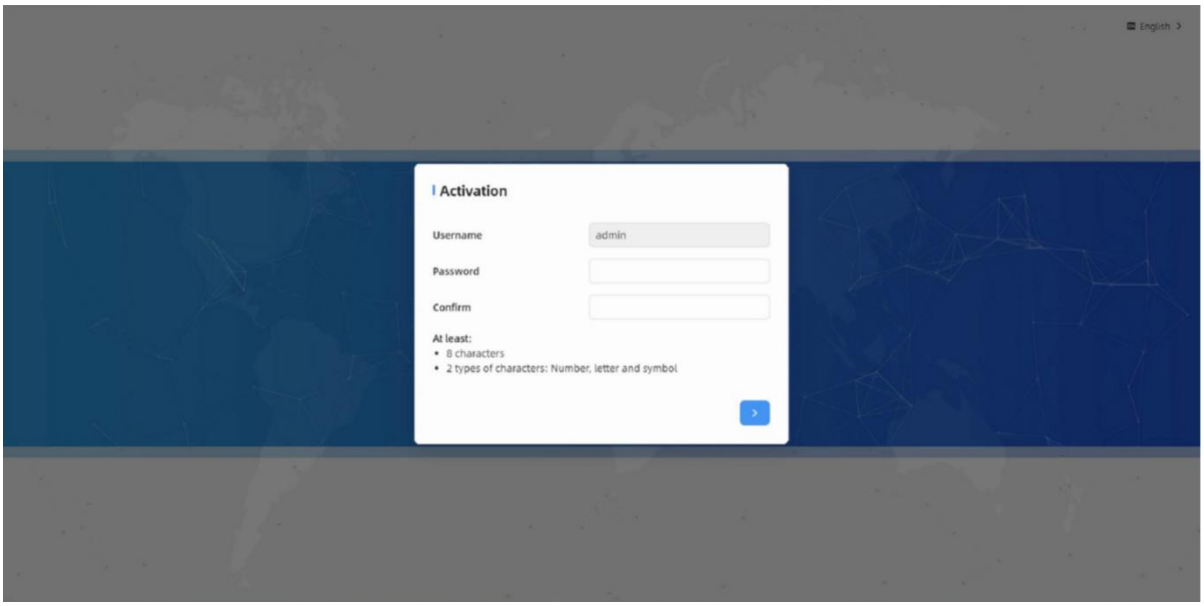


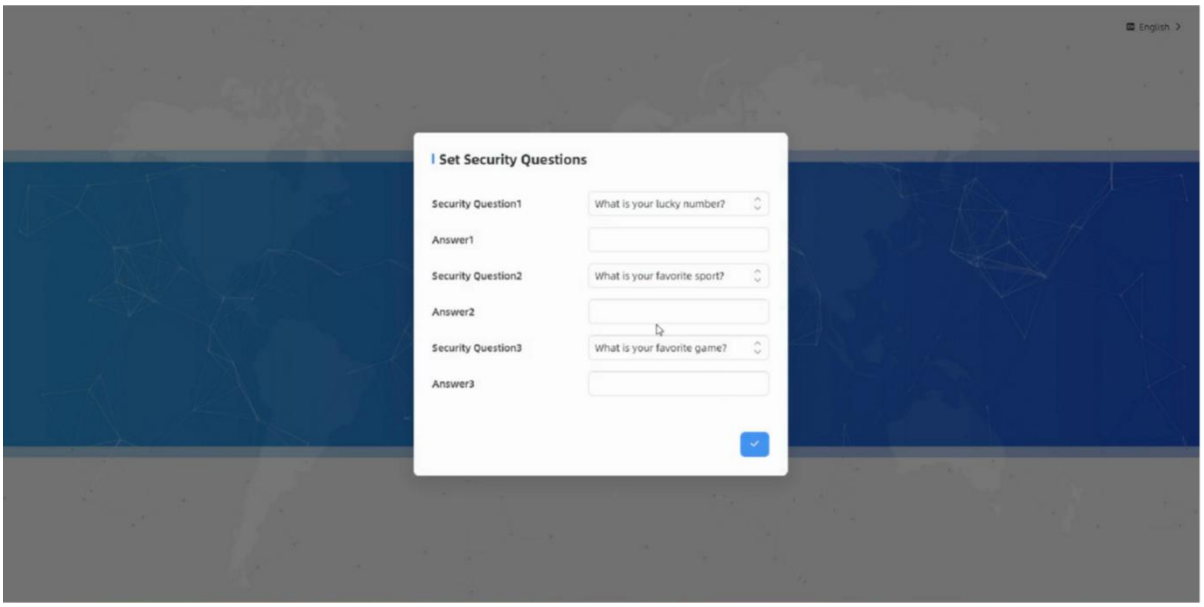
Parameters	Description
Scene Preview	Select video stream preview, static image preview or no image preview as needed.
Image Type	Select Monochrome or Pseudo-color image type.
Resolution	Click to output high level signal from alarm out interface when Manual DO event is enabled. **Low:** Display blurred images, but still allow viewing of scenes and moving people **High:** Display clear scenes and people faces

Step 4: After configuration, log in with username (admin) and custom password.

Note:

1) Password must be 8 to 16 characters long, which contains at least two kinds or more in combination with numbers, lowercase letters, uppercase letters and special characters.
2) You can click the “forgot password” in login page to reset the password by answering three security questions when you forget the password if you set the security questions in advance.

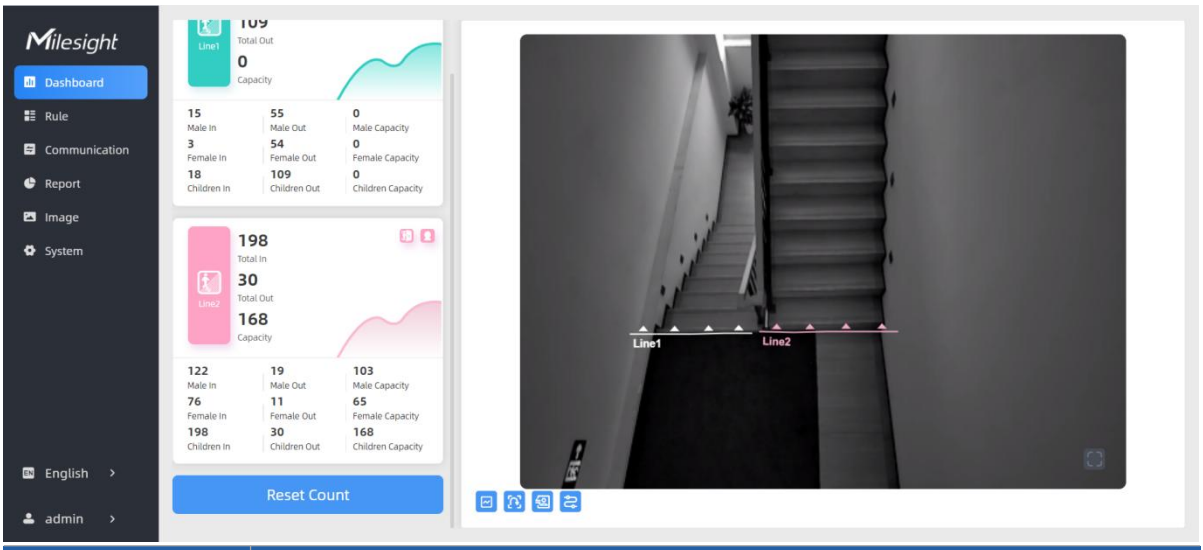




5. Operation Guide

5.1 Dashboard

After logging on to the device web GUI successfully, user is allowed to view live video as following.



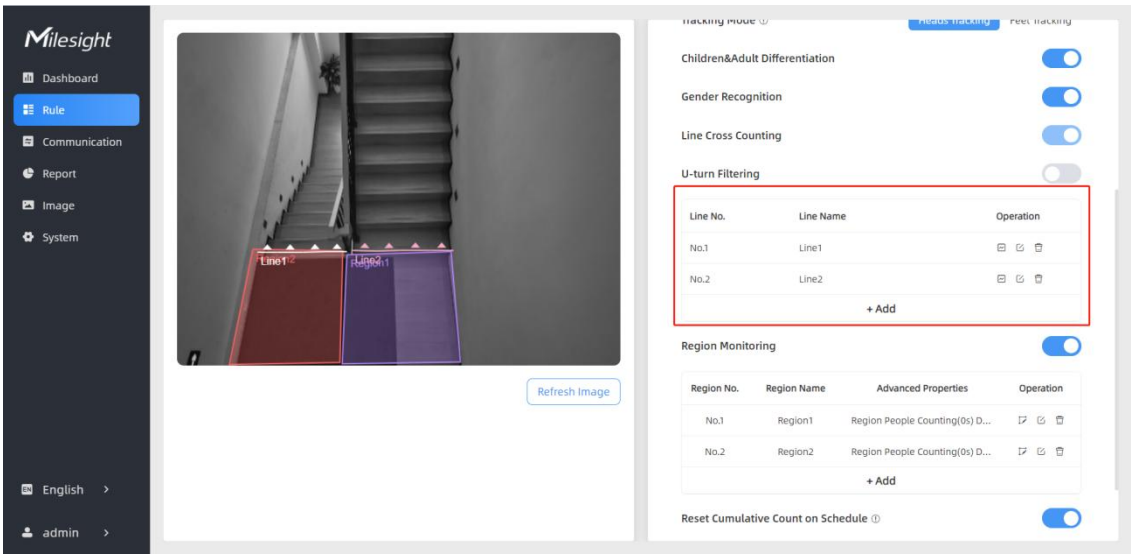
Parameters	Description
	Hide Capacity: Hide the total count data capacity; **Children Excluded:** Exclude children data from statistical data.
Reset Count	Clear all accumulated entrance and exit people counting values.
	Click to show detection lines, U-turn areas, detection regions and tracking lines as needed.

5.2 Rule

Draw Detection Lines

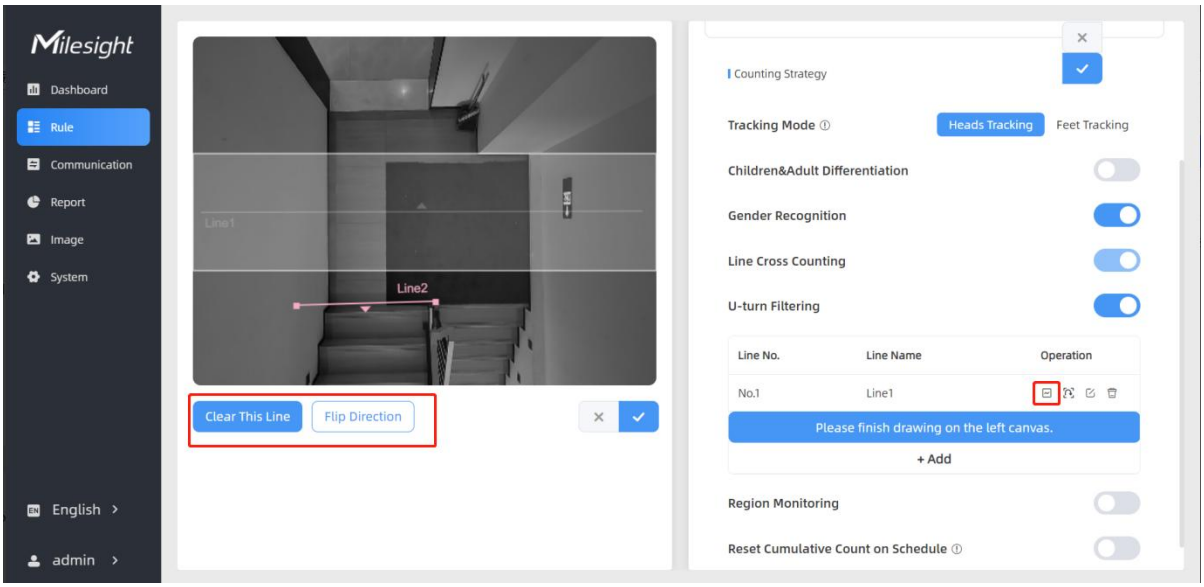
Users can draw detection lines to record the people count values which indicate the number of people enter or exit.

Step 1: Find the list of detection lines. Click **+Add** to draw a new detection line or click to edit the existed detection line on the live view.



Step 2: Left-click to start drawing and drag the mouse to draw a line, left-click again to continue drawing a different direction edge, and right-click the mouse to complete the drawing. The line can be dragged to adjust the location and length. One device supports at most 4 broken lines with maximum 4 segments each.

Step 3: If users want to redraw this line, click **Clear This Line** or drag the vertices of the broken line to adjust. The arrow direction of the detection line depends on your drawing direction. If users need to flip the line, click **Flip Direction.** Then click to finish drawing.



Step 4: Users can click to customize the name of line. If users need to delete a certain line, click .

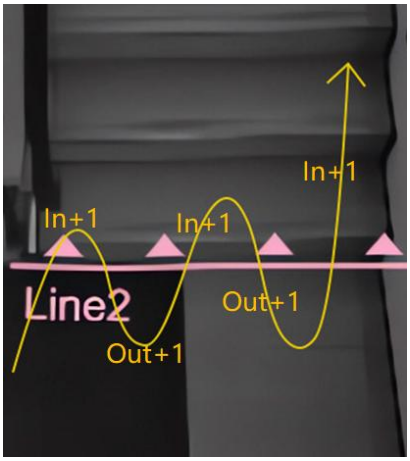
Note:

1) Ensure that the detected target can pass through the detection line completely. It's recommended that the detection line is perpendicular to the In/Out direction and on the center of the detection area without other objects around.
2) Redundant identification spaces are needed on both sides of the detection line for the target detection. It ensures the stable recognition and tracking of the target before passing the detection line, which will make the detection and count more accurate.

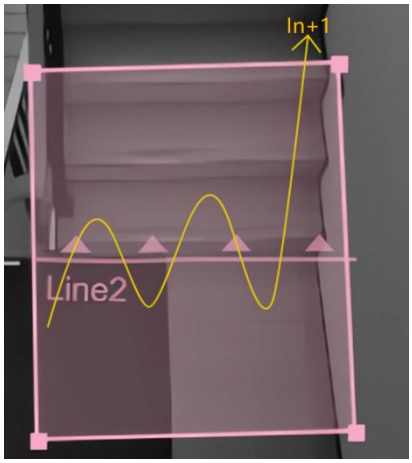
Draw U-turn Area

VS125 supports the U-turn filtering function, filtering out the people who are actually not in / out of the entrance, to avoid repeated counting. Users can draw an area for every line and the device will count the In and Out values only when people pass this area.

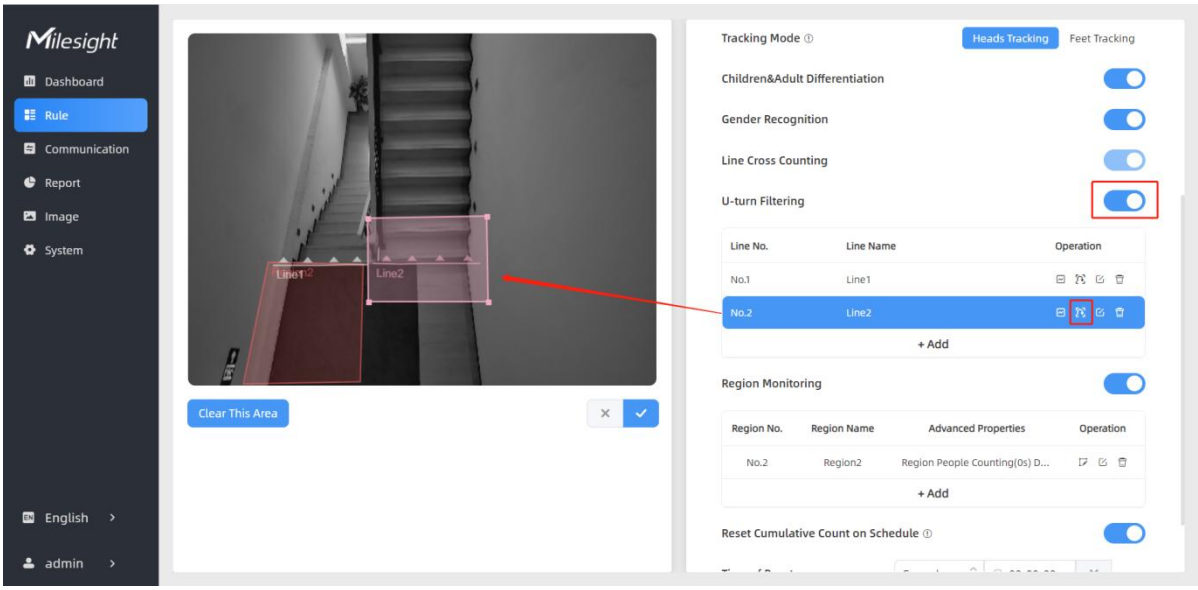
Disable U-turn filtering:



Enable U-turn filtering:



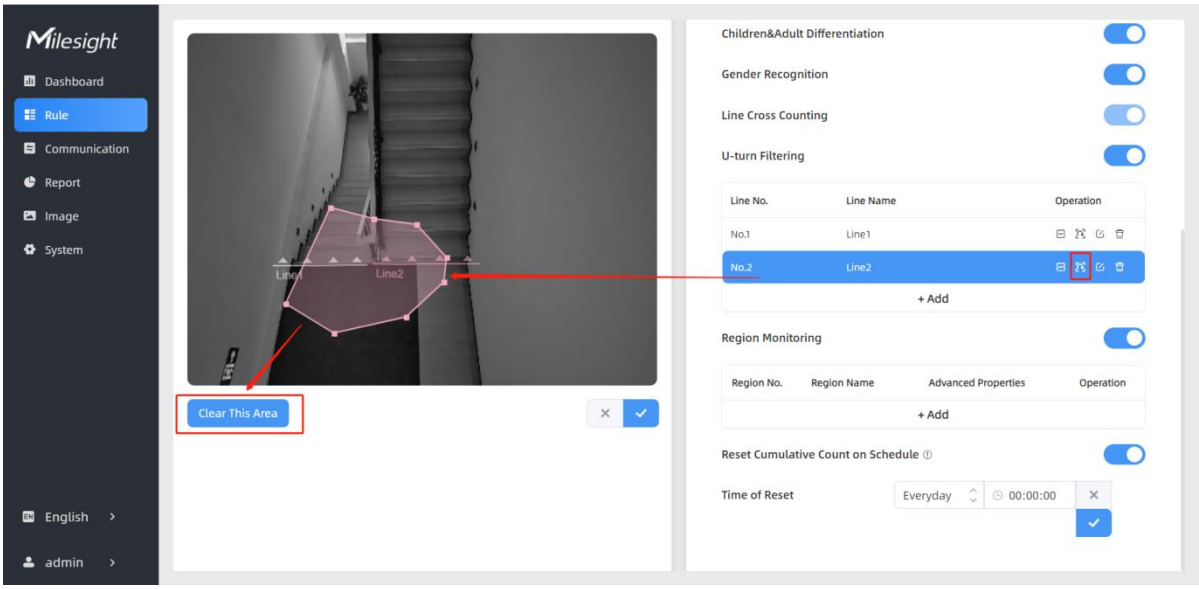
Step 1: Enable U-turn Filtering. Users can click to edit U-turn areas for existed detection line on the live view.



Step 2: Left-click to start drawing and drag the mouse to draw an edge. Then left-click again to continue drawing a different direction edge. Right-click the mouse to complete the drawing. The area can be dragged to adjust the location and length. One device supports up to 4 areas with maximum 10 segments each.

Step3: If users want to redraw the area, click **Clear This Area** or drag the vertices of the area to adjust. Then click to finish drawing.

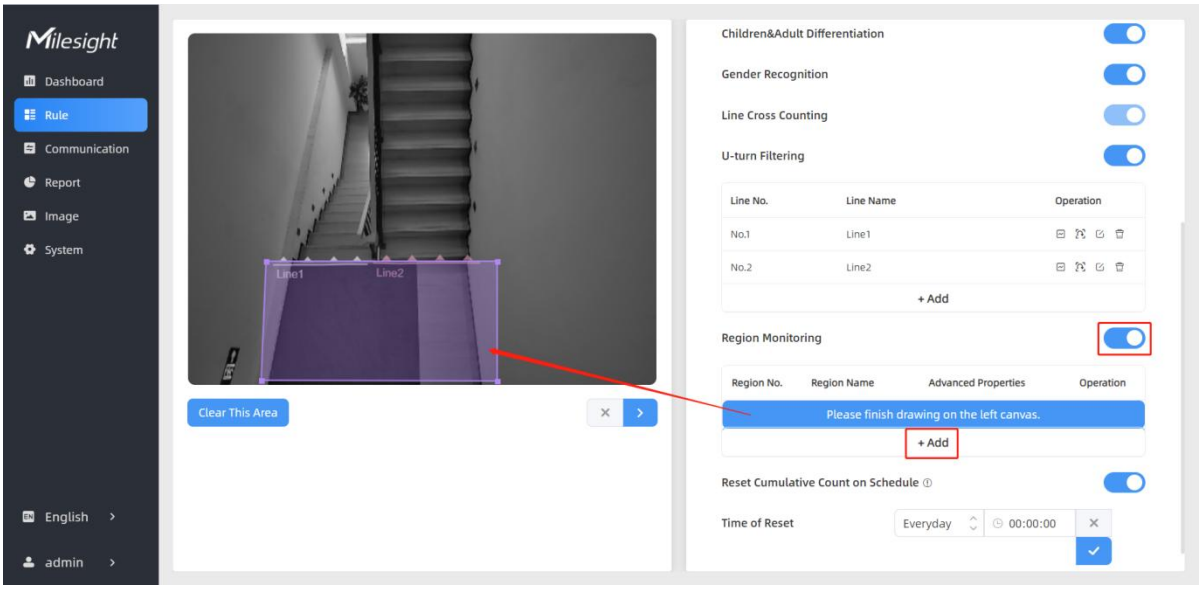
Step 4: If users need to delete a certain U-turn area, click , then click **Clear This Area**.



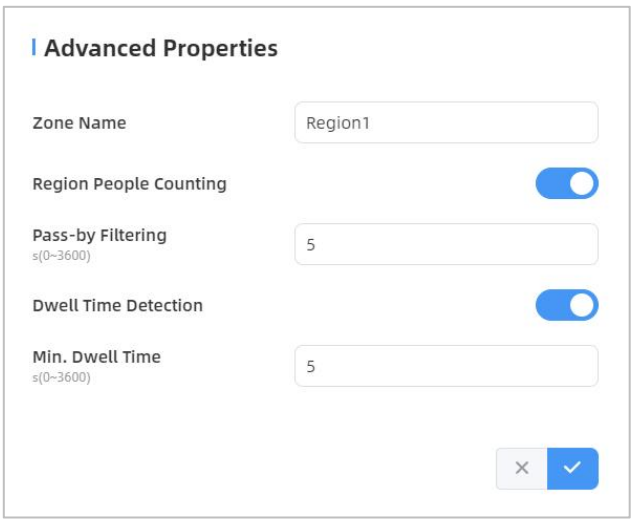
Draw Monitoring Region

VS125 supports monitoring the number and the dwell time of people in the region, providing more valuable analysis data.

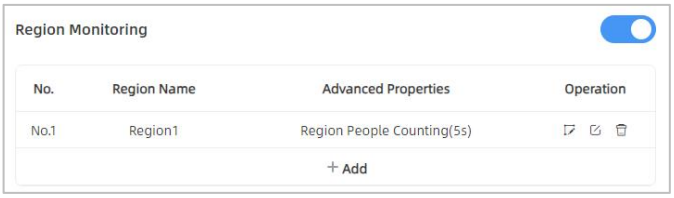
Step 1: Enable Region Monitoring**.** Click **+Add** to add the region monitoring on the live view. Up to 4 regions are supported with maximum 10 segments each.



Step 2: Customize the zone name and enable Region People Counting or Dwell Time Detection as needed.

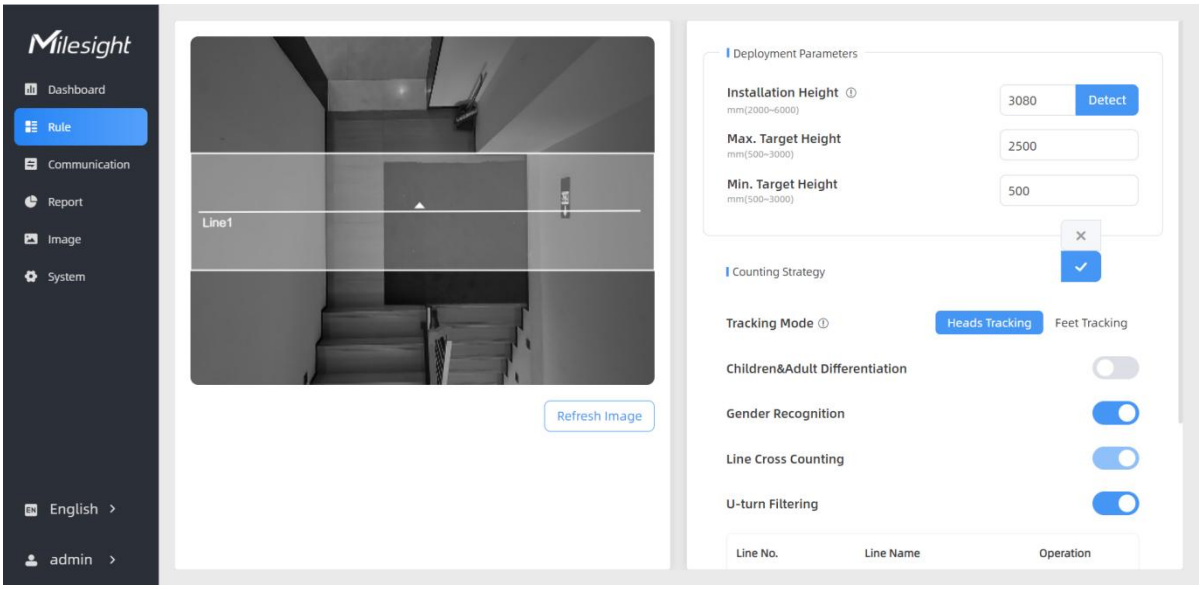


Step 3: The configuration is displayed in the list after the configuration is complete. You can redraw the areas by clicking the redraw button in the list. Click the edit button to modify the advanced settings of the areas or click delete button to delete the areas separately.

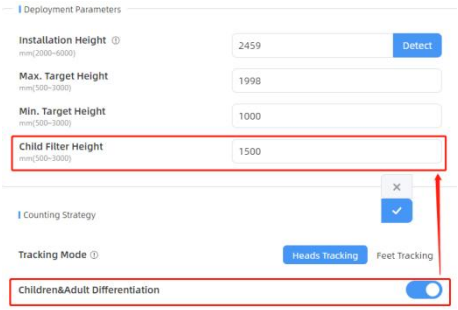


Rule Configuration

Users can set the rules to ensure accurate counting.



Parameters	Description
Installation Height	Set the device installation height. Click **Detect** to detect the current installation height automatically. **Note:** When the ground lacks patterns or textures or during low-light

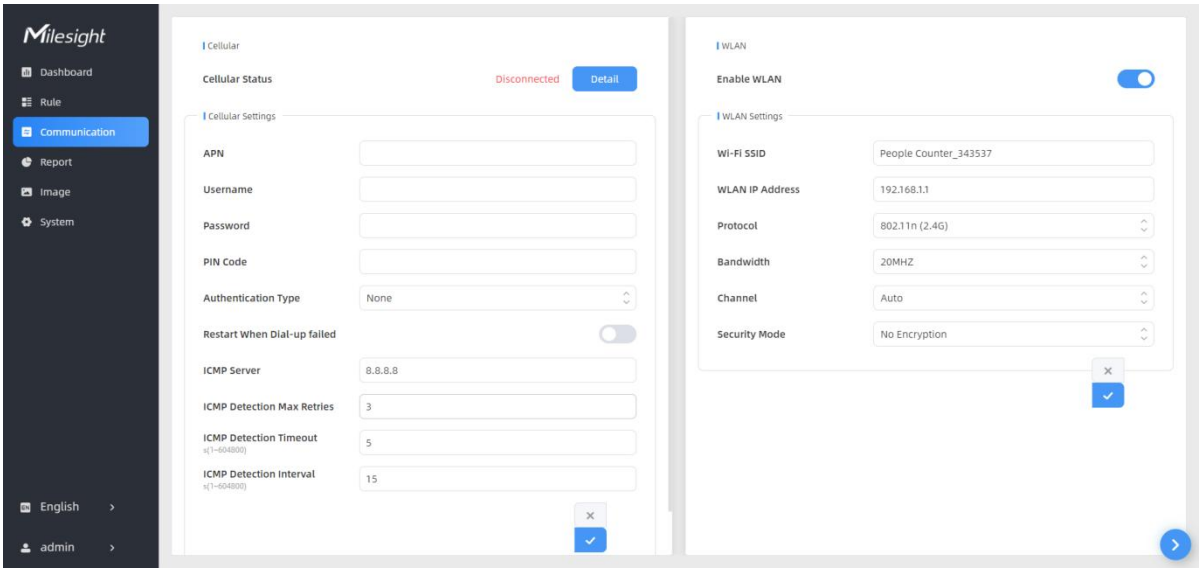
	conditions at night, the automatic height detection may be inaccurate.
Max. Target Height	Set the maximum target height, then the device will ignore the objects higher than this setting value.
Min. Target Height	Set the minimum target height, then the device will ignore the object shorter than this setting value.
Tracking Mode	Select the tracking mode of counting, including Heads Tracking and Feet Tracking.
Children & Adult Differentiation	The device will detect the people shorter than child filter height as children. 
Gender Recognition	The device will detect the people who are male or female.
U-turn Filtering	Enable or disable U-turn Filtering.
Region Monitoring	Enable or disable Region Monitoring.
Reset Cumulative Count on Schedule	Enable to periodically reset cumulative count on schedule. Cumulative Count includes: Total In/Out counting of each detection line. Max./Avg. Dwell Time of each detection region.

5.3 Communication

5.3.1 Network Configuration

VS125 supports variety of ways for data transmission.

Cellular (Cellular Version Only)



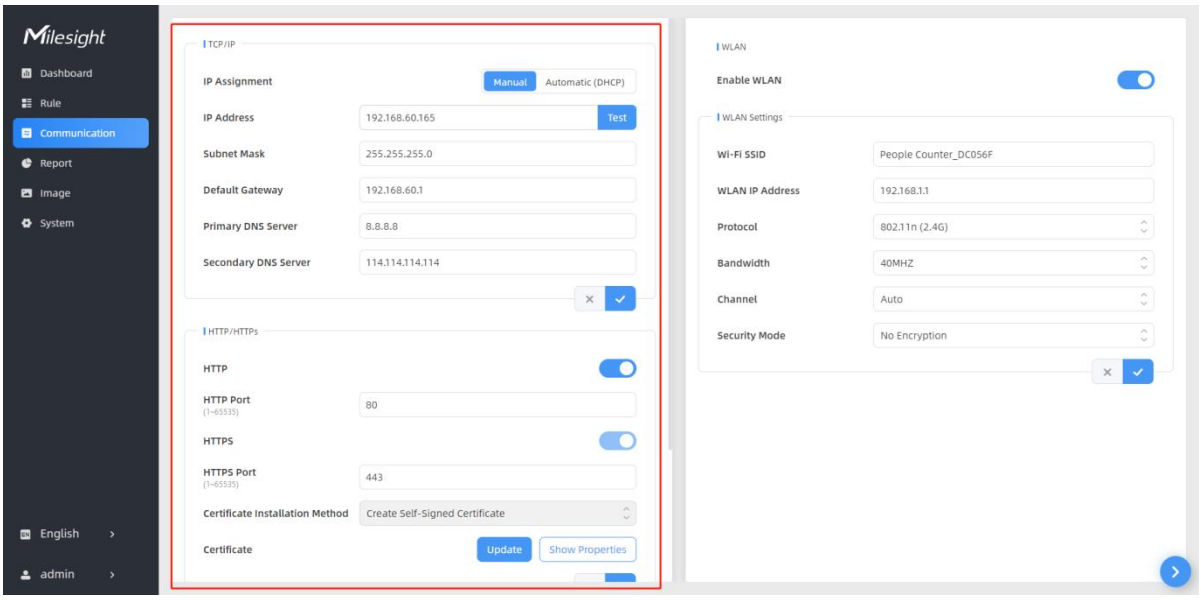
Parameters		Description
Cellular	Cellular Status	Display the connection status of the network, including "connect" and "disconnect". You can also click "Detail" button to view the cellular status.
Cellular Settings	APN	Enter the Access Point Name for cellular dial-up connection provided by local ISP. The max length is 31 characters.
	Username	Enter the username for cellular dial-up connection provided by local ISP. The max length is 31 characters.
	Password	Enter the password for cellular dial-up connection provided by local ISP. The max length is 31 characters.
	PIN Code	Enter a 4-8 characters PIN code to unlock the SIM.
	Authentication Type	Select the Authentication Type. None, PAP, CHAP, PAP and CHAP are optional.
	Roaming	Click to enable the Roaming.
	Restart When Dial-up Failed	Enable automatic device restart when multiple dial-up failed.
	ICMP Server	Configure the IP address of the ICMP detection server.
	ICMP Detection Max Retries	Set the maximum number of retries when ICMP detection failed.
	ICMP Detection Timeout	Configure ICMP detection timeout.
	ICMP Detection Interval	Configure ICMP detection interval.

Cellular Status

Parameters		Description
Cellular Status	Refresh	Click this button to manually refresh the above status.
	Modem Status	Show the corresponding detection status of the module and SIM card. ● No SIM Card

		● SIM Card Error ● PN Error ● PIN Required ● PUK Required ● No Signal ● Ready ● Down SIM
	Model	Show the model name of the cellular module
	Version	Show the version of the cellular module.
	Signal Level	Show the current signal strength of the network.
	Register Status	Show the connection status of the network, including “connect” and “disconnect”.
	IMEI	Show the IMEI of the module.
	IMSI	Show IMSI of the SIM card.
	ICCID	Show ICCID of the SIM card.
	ISP	Show the network provider which the SIM card registers on. **Note:** It will display "-" when the SIM card is not inserted or not recognized.
	Network Type	Show the connected network type, such as LTE and 3G. **Note:** It will display "-" when the device is not connected to network.
	PLMN ID	Show the current PLMNID, including MCC, MNC, LAC, and Cell ID.
	LAC	Show the location code of the SIM card. **Note:** It will display "-" when the SIM card is not inserted or not recognized.
	Cell ID	Show the Cell ID of the SIM card location. **Note:** It will display "-" when the SIM card is not inserted or not recognized.
	Network Status	Show the Network Status, IP Address, Netmask, Gateway and DNS Address of the current network. If the SIM card is not inserted or not recognized, it will display 0.0.0.0.
	IP Address	
	Netmask	
	Gateway	
	DNS	
	Connection Duration	Show the cellular dial-up connection duration.

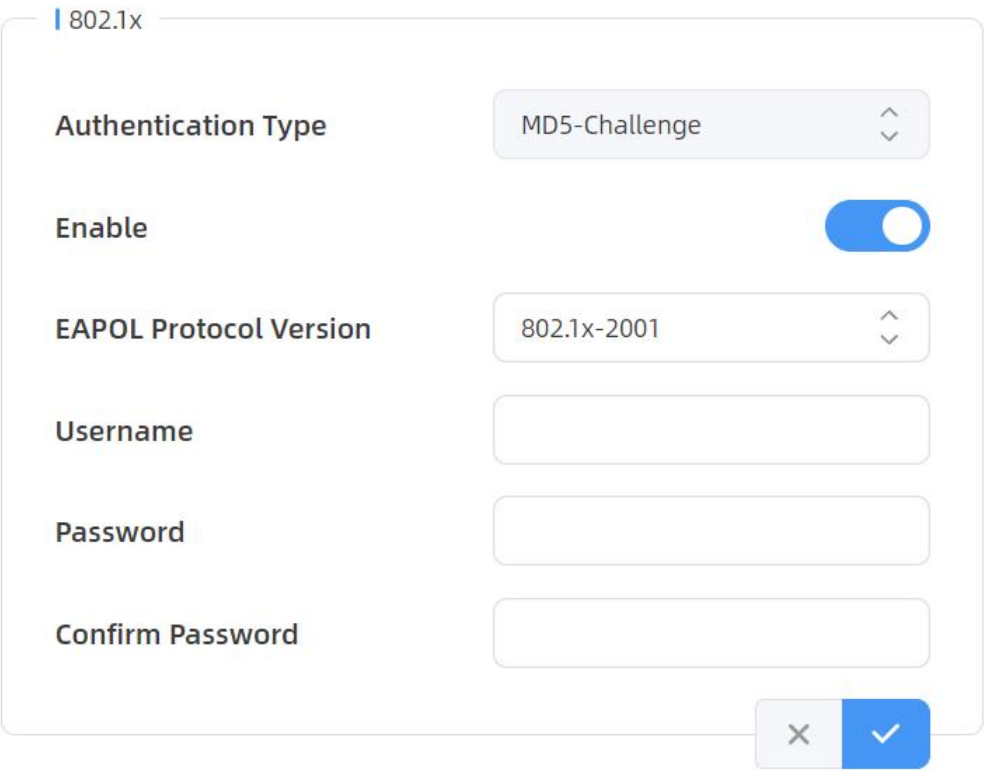
TCP/IP & HTTP/HTTPs (PoE Version Only)



Parameters	Description
TCP/IP	
IP Assignment	Manual or Automatic (DHCP) is optional.
IP Address	Set the IPv4 address of the Ethernet port, the default IP is **192.168.5.220**.
Test	Click to test if the IP is conflicting.
Subnet Mask	Set the Netmask for the Ethernet port.
Default Gateway	Set the gateway for the Ethernet port's IPv4 address.
Primary DNS Server	Set the primary IPv4 DNS server.
Secondary DNS Server	Set the secondary IPv4 DNS server.
HTTP/HTTPs	
HTTP	Start or stop using HTTP.
HTTP Port	Web GUI login port, the default is 80.
HTTPS	Start or stop using HTTPS.
HTTPS Port	Web GUI login port via HTTPS, the default is 443.
Certificate Installation Method	Create Self-signed Certificate: upload the custom CA certificate, client certificate and secret key for verification.
Certificate	Create the SSL certificate.

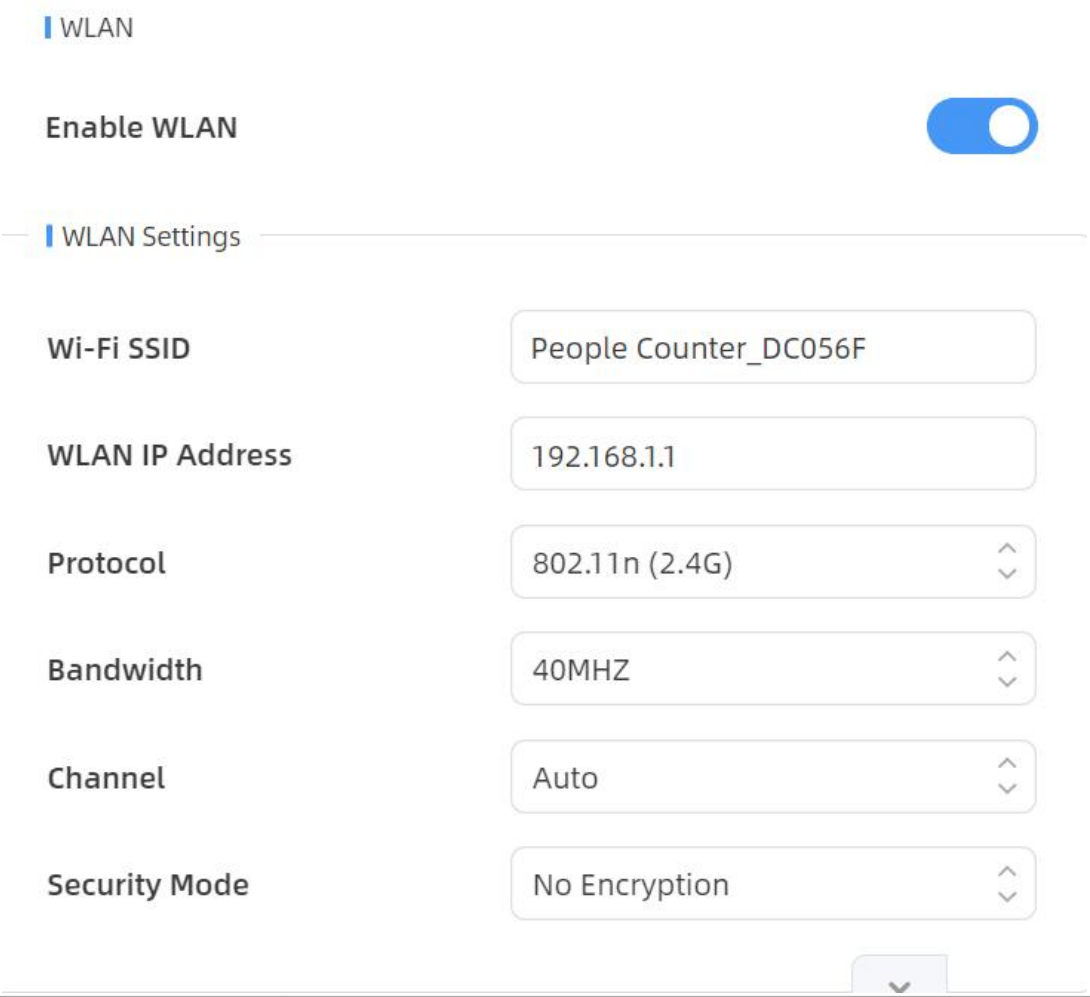
802.1x Protocol (PoE Version Only)

The IEEE 802.1x is an authentication protocol to allow access to networks with the use of RADIUS server.



Parameters	Description
Authentication Type	It's fixed as MD5-Challenge.
Enable	Enable or disable 802.1x authentication.
EAPOL Protocol Version	802.1x-2001 or 802.1x-2004 is optional.
Username	Set the username for 802.1x authentication.
Password	Set the password for 802.1x authentication.
Confirm Password	Enter the password again.

WLAN

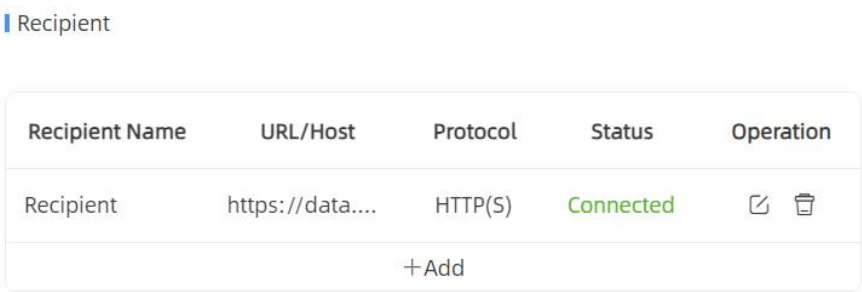


Parameters	Description
Enable WLAN	Enable or disable Wi-Fi feature. If disabled, users can use button to enable it.
Wi-Fi SSID	The unique name for this device Wi-Fi access point, defined as People Counter_xxxxxx (can be found on the device label).
WLAN IP Address	Configure WLAN IP address for web access, the default IP address is 192.168.1.1.
Protocol	802.11g (2.4 GHz) and 802.11n (2.4 GHz) are optional.
Bandwidth	20 MHz or 40 MHz are optional.
Channel	Select the wireless channel. Auto, 1,...11 are optional.
Security Mode	No Encryption, WPA-PSK, WPA2-PSK and WPA-PSK/WPA2-PSK are optional.
Cipher	AES, TKIP, AES/TKIP are optional.
Wi-Fi Password	Customize the password when security mode is not No Encryption.

5.3.2 Recipient & API

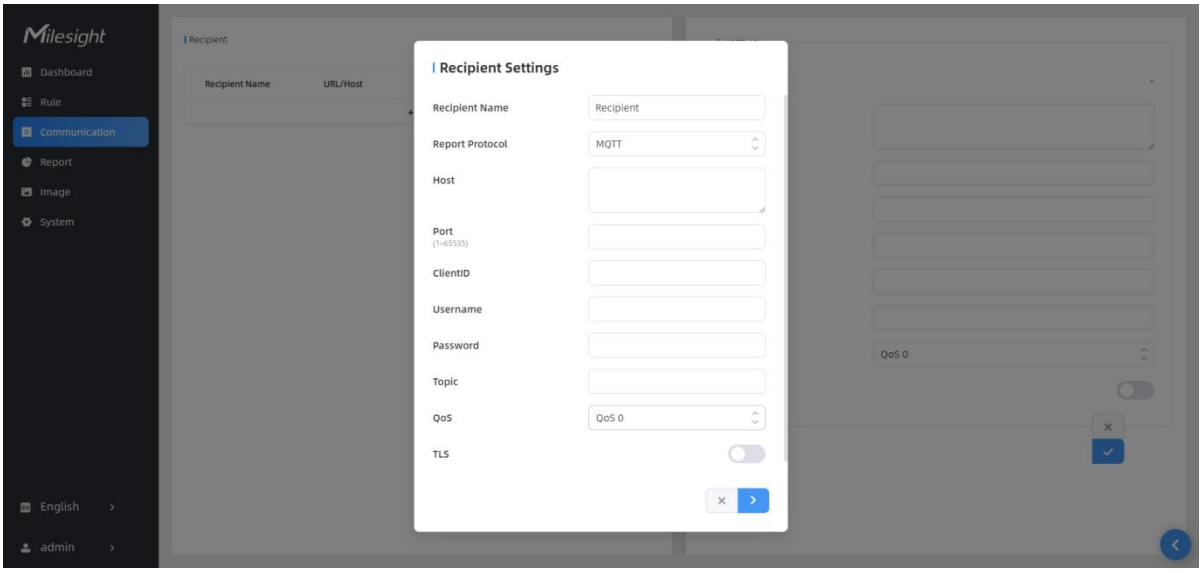
Recipient

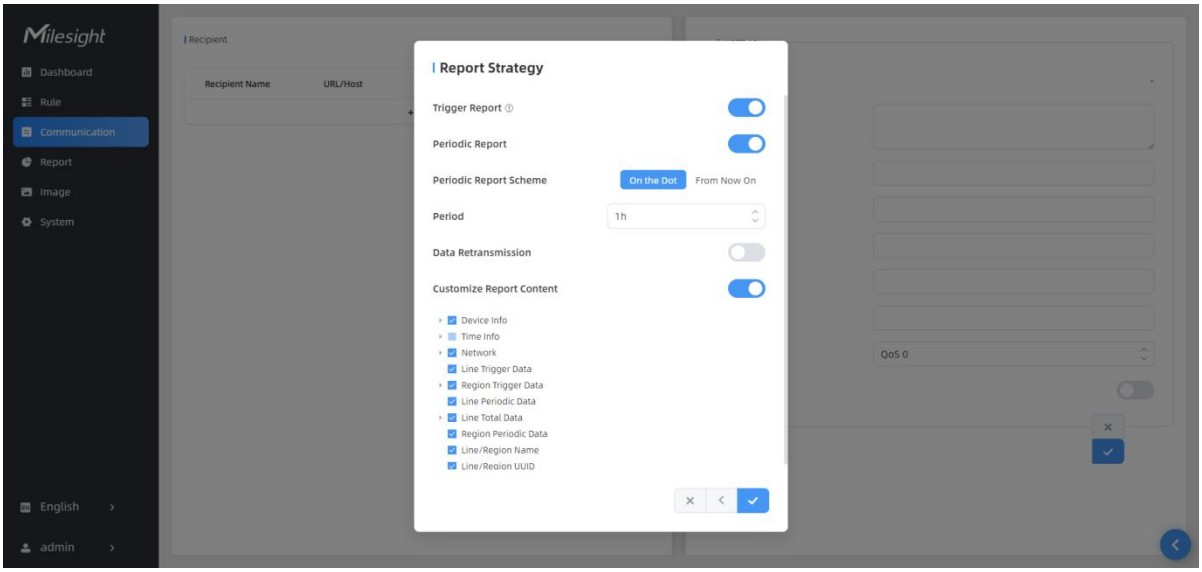
VS125 supports to add data receivers (supports HTTP(s)/MQTT(s)). The device will proactively push data to the receivers according to the configured reporting scheme. Besides, users can get the people counting data or configure the device via CGI. For CGI document, please contact Milesight IoT support: iot.support@milesight.com.



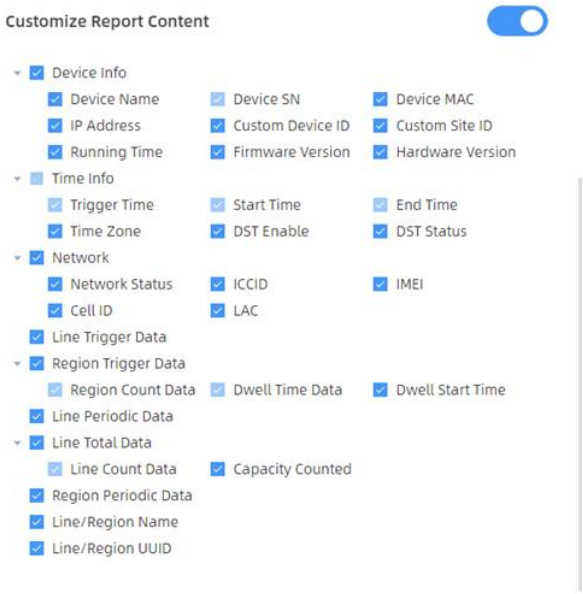
Parameters	Description
Recipient Name	Show the recipient name.
URL/Host	Show the URL/host of HTTP(s) server or MQTT broker.
Protocol	Show the report protocol.
Status	Show connection status from device to HTTP(s) server or MQTT broker.
Operation	Click to edit the information or delete the recipient.

Note: Up to 8 receivers can be added.



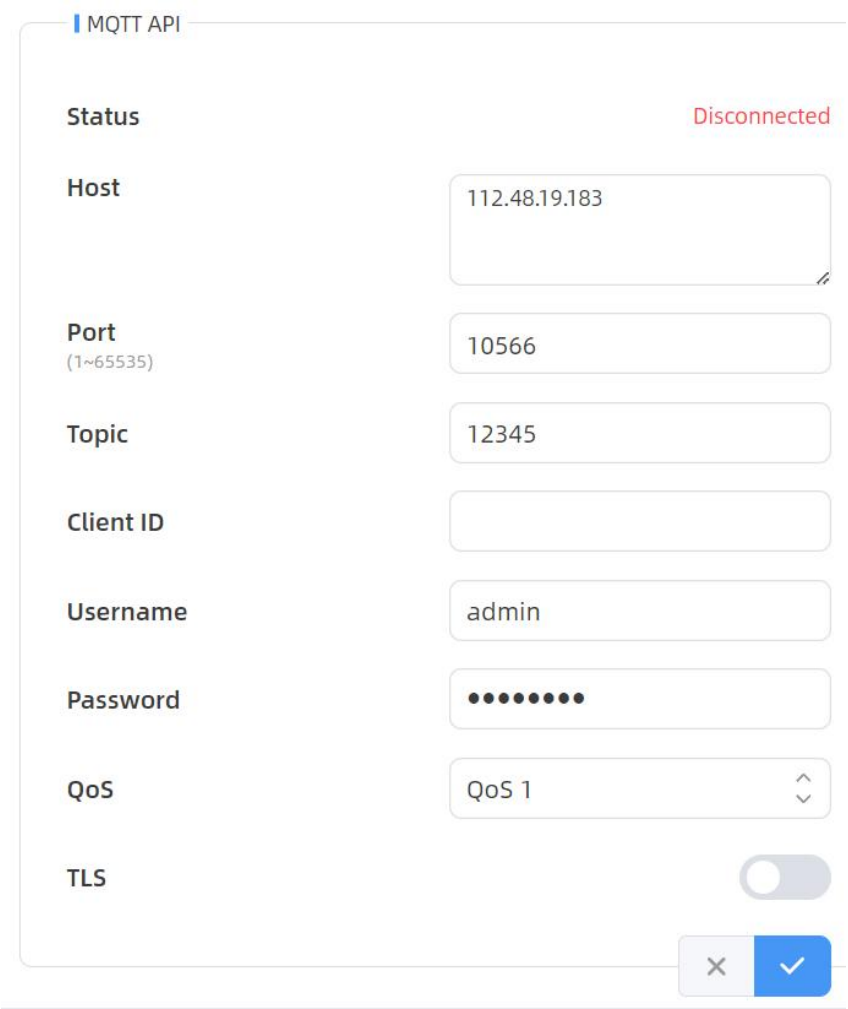


Parameters	Description
Recipient Name	Customize the recipient name.
Report Protocol	HTTP(s) or MQTT is optional.
HTTP(s)	
URL	The device will post the people counting data in json format to this URL.
Connection Test	Click **Test** to send test message to URL to check connectivity.
Username	The username used for authentication.
Password	The password used for authentication.
MQTT	
Host	MQTT broker address to receive data.
Port	MQTT broker port to receive data.
Client ID	Client ID is the unique identity of the client to the server. It must be unique when all clients are connected to the same server, and it is the key to handle messages at QoS 1 and 2.
Username	The username used for connecting to the MQTT broker.
Password	The password used for connecting to the MQTT broker.
Topic	Topic name used for publishing.
QoS	QoS0, QoS1, and QoS2 are optional.
TLS	Enable the TLS encryption in MQTT communication.
Certificate Type	CA Signed Server or Self Signed is optional. **CA signed server certificate:** verifying with the certificate issued by Certificate Authority (CA) that is pre-loaded on the device. **Self signed certificates:** upload the custom CA certificates, client certificates and secret key for verification.
Report Strategy	
Trigger Report	Report immediately when there is a change of the line crossing people counting number or region people counting number.
Periodic Report	Select the periodic report of “On the Dot” or “From Now On”.
Periodic Report	**On the Dot:** The device will report at the top of each hour. For example,

Scheme	When the interval is set to 1 hour, it will report at 0:00, 1:00, 2:00 and so on; when the interval is set to 10 minutes, it will report at 0:10, 0:20, 0:30, and so on. **From Now On:** Begin reporting from this moment onwards and regularly report based on the interval cycle.
Period	
Data Retransmission	Enable to resend stored data packets from the disconnected period when the device's network connection is restored. Every recipient supports to receive 50,000 pieces of data at most.
Customize Report Content	Customizable selection of content to be reported, avoiding data redundancy. 

MQTT API (Cellular Version Only)

VS125 provides MQTT API to support to receive downlink commands from MQTT broker to get people counting data and achieve the configuration. For API document, please contact Milesight IoT support: iot.support@milesight.com.



Parameters	Description
Status	Show connection status between device and MQTT broker.
Host	MQTT address to receive data.
Port	MQTT port to receive data.
Topic	Topic name used for publishing.
Client ID	Client ID is the unique identity of the client to the server. It must be unique when all clients are connected to the same server, and it is the key to handle messages at QoS 1 and 2.
Username	The username used for connecting to the MQTT.
Password	The password used for connecting to the MQTT.
QoS	QoS0, QoS1, QoS2 are optional.
TLS	Enable the TLS encryption in MQTT communication.
Certificate Type	CA Signed Server or Self Signed is optional. **CA signed server certificate:** verifying with the certificate issued by Certificate Authority (CA) that is pre-loaded on the device. **Self signed certificates:** upload the custom CA certificates, client certificates and secret key for verification.

5.4 Report

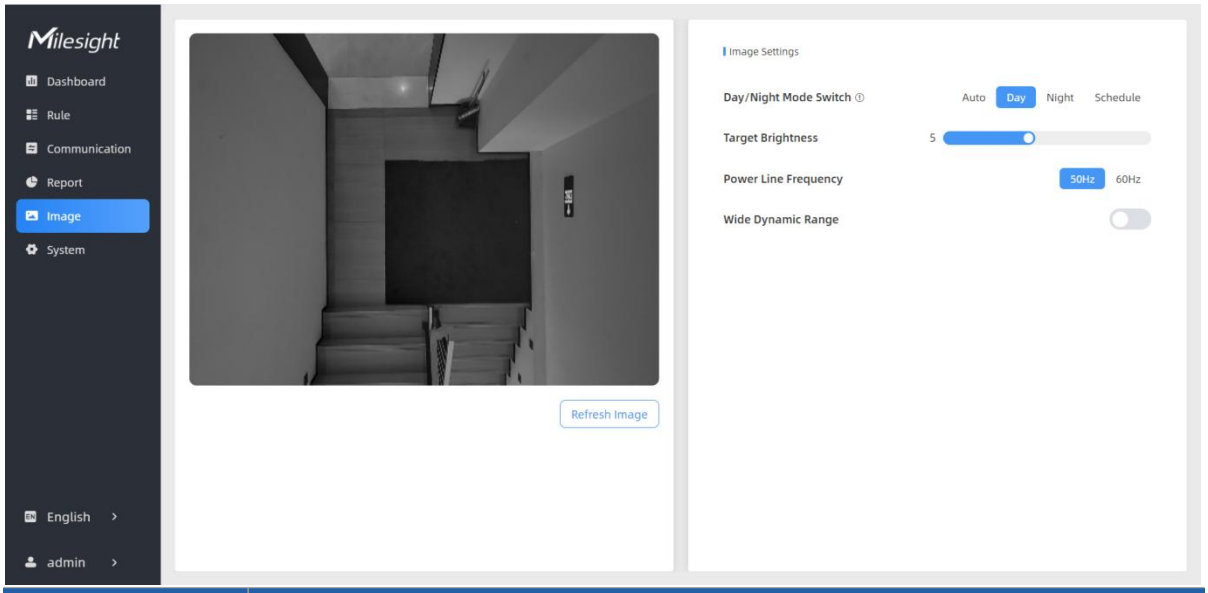
VS125 supports visual line chart or bar chart generation to display people traffic and supports report exporting. Before using this feature, do ensure that the device time is correct on **System** page.

Parameters	Description
Event	Select the event which you want to query the report. Line crossing counting, region people counting and dwell time detection are optional.
Time Unit	Select the unit to generate the graph or export the data.
Time Range	Select the time range to generate the graph.
Line1	Select the line to display the graph.
Region1	Select the region to display the graph.
Search	Click to generate the graph according to the time range and line option.
	Select the display type as line or bar.
	Click to download the chart screenshot.
	Export the historical traffic data as CSV file according to the selected time unit. The device can store up to one million data records to CSV file.

5.5 Image

VS125 has great lighting adaptability that allows it to work well in low light or even complete

dark environments.It supports day and night mode switching based on the no-photosensitive scheme.

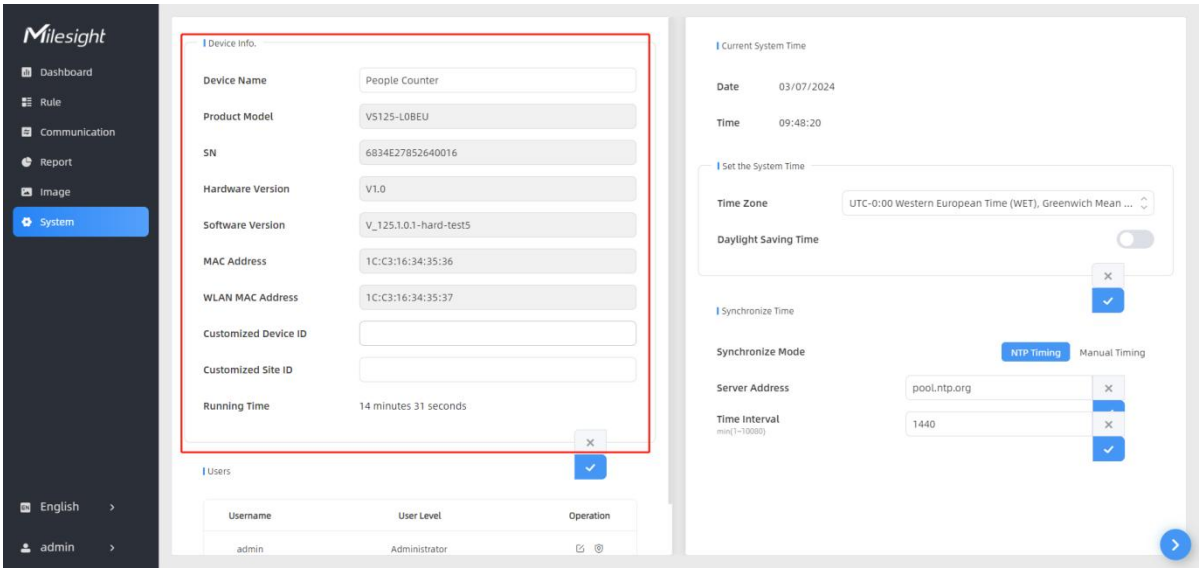


Parameters	Description
Day/Night Mode Switch	Set image mode. Auto, Day, Night and Schedule are optional. **Day:** black and white mode; **Night:** infrared based black and white mode; **Auto:** automatic switch day and night according to image brightness; **Schedule:** switch day and night according to the configured schedule.
Sensitivity	Set the sensitivity of the automatic day and night switching.The higher sensitivity, the easier to switch day and night.
Night Mode Duration	Set the schedule of the night mode.
Target Brightness	Set the brightness of the target to make image clearer. The higher brightness is, the brighter the target brightness is.
Power Line Frequency	Choose the frequency to avoid the image flashing.
Wide Dynamic Range	Enable or disable WDR. Enabling WDR can capture more detail in scenes where light conditions vary greatly.

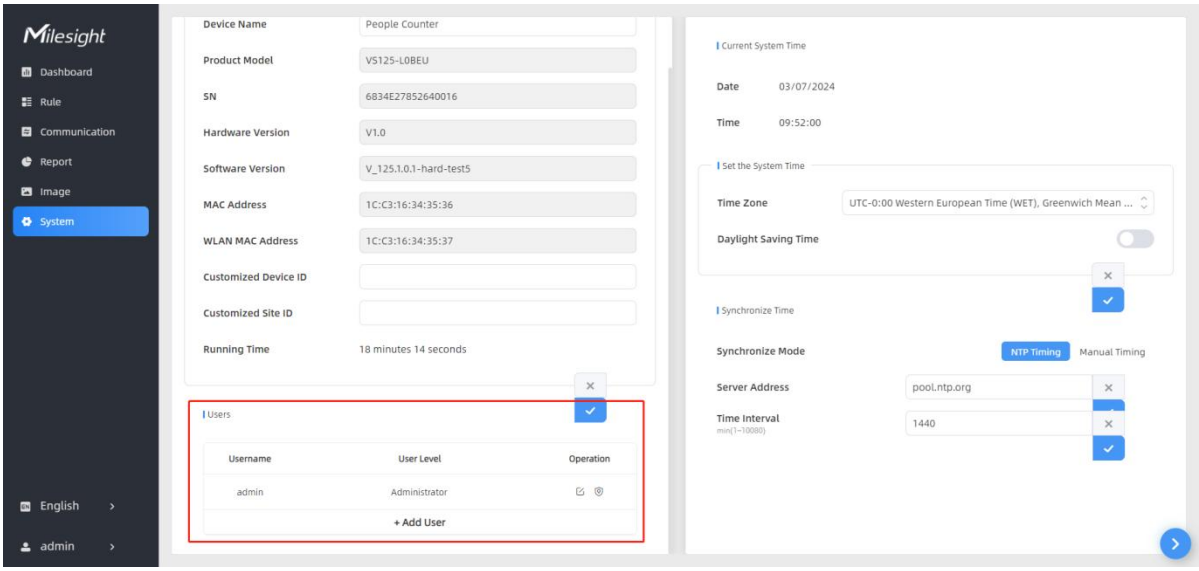
5.6 System

5.6.1 Device Info

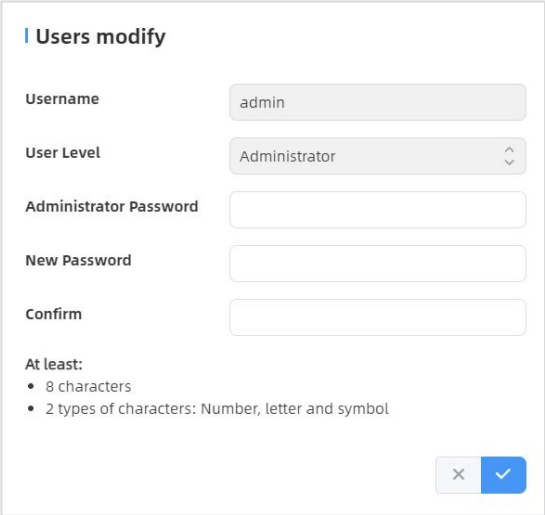
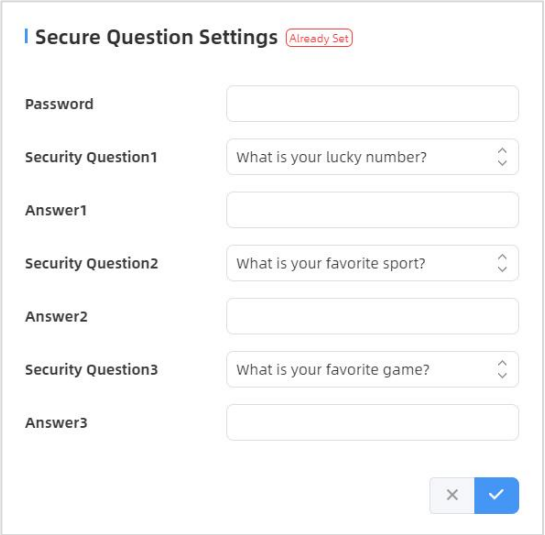
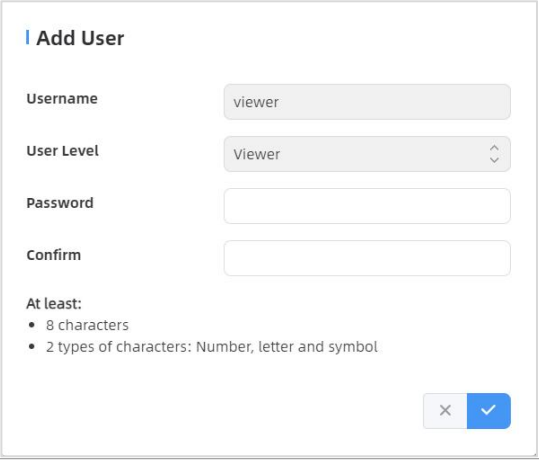
All information about the hardware and software can be checked on this page. Besides, users can modify the device name, customize device ID and site ID for large amounts of devices management.



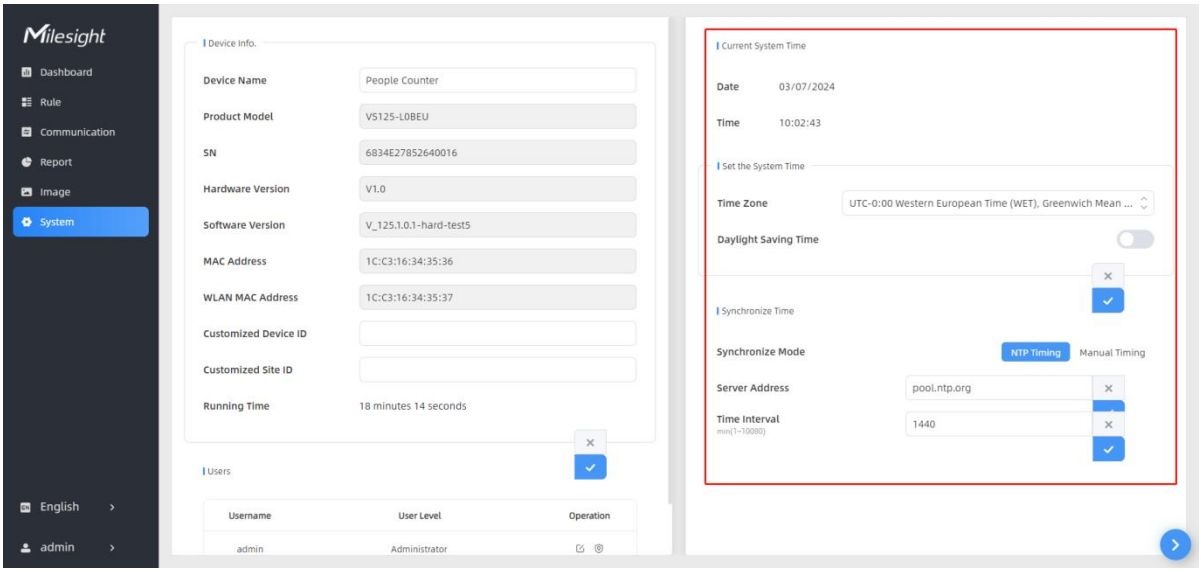
5.6.2 User



Parameters	Description
	You can change the login password of this device.

	
	Click to set three security questions for your device. In case that you forget the password, you can click **Forget Password** button on login page to reset the password by answering three security questions correctly. 
+ Add User	Click to add a viewer, who will only have access to the "Dashboard" and "Report" interfaces. 

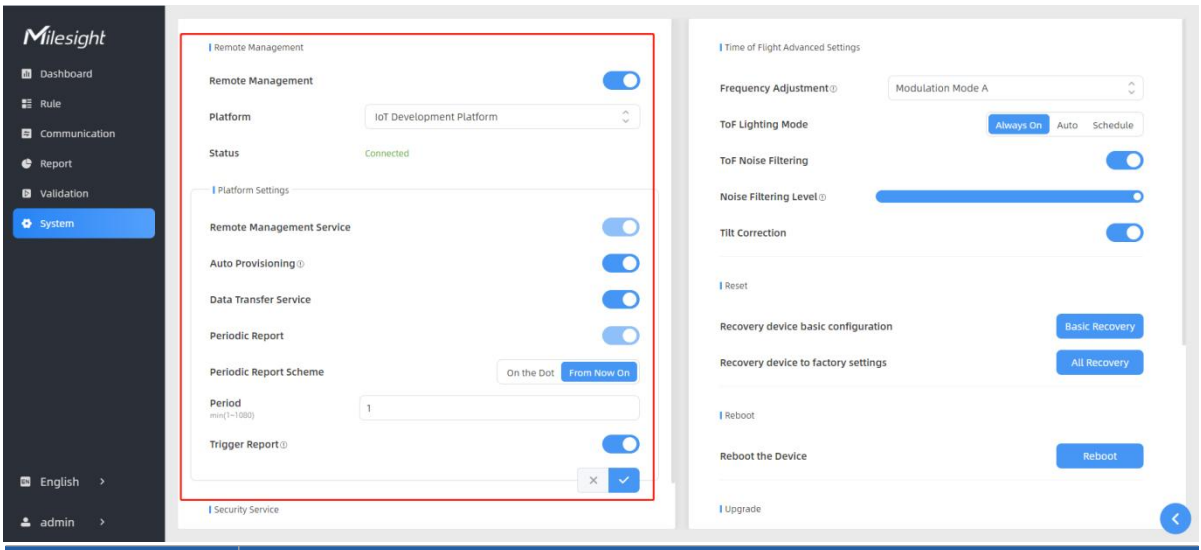
5.6.3 Time Configuration



Parameters	Description
Time Zone	Choose the time zone for your location.
Daylight Saving Time	Enable or disable Daylight Saving Time (DST). **Start Time:** the start time of DST time range. **End Time:** the end time of DST time range. **DST Bias:** the DST time will be faster according to this bias setting.
Synchronize Mode	NTP Timing or Manual Timing is optional.
Server Address	NTP server address to sync the time.
Time Interval	Set the interval to sync time with NTP server.
Setting Time	Set the device time manually.
Synchronize with computer time	Synchronize the time with your computer.

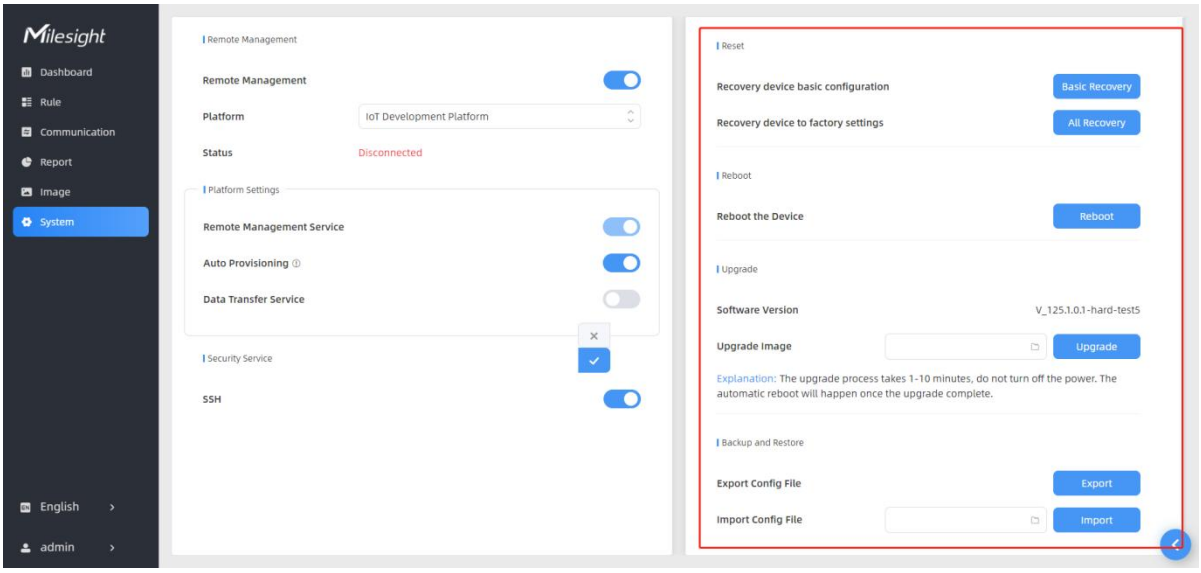
5.6.4 Remote Management

Milesight provides remote management service for this device via Milesight DeviceHub platform or Milesight Development Platform. Before connecting, do ensure the device is connected to the network and Internet connection is stable.



Parameters	Description
Remote Management	
Remote Management	Enable or disable to manage the device through Milesight platforms.
Platform	DeviceHub or IoT Development Platform is optional.
Status	Show the connection status between the device and the DeviceHub.
IoT Development Platform	
Remote Management Service	Enable to change the device settings via Milesight Development platform.
Auto Provisioning	Enable to receive and deploy the configurations from Milesight Development Platform after the device is connected to Internet.
Data Transfer Service	Report people counting data to Milesight Development platform.
DeviceHub 2.0 (PoE Version Only)	
Server Address	IP address or domain of the DeviceHub 2.0 management server.
Synchronize Device Name	Enable or disable to synchronize device name on devicehub 2.0.
Synchronize Customized ID	Customize the device ID and site ID.
Security Service	
SSH	Enable or disable SSH access. The SSH port is fixed as 22.

5.6.5 System Maintenance



Parameters	Description
Reset	**Recovery device basic configuration:** keep the IP settings and user information when resetting.
	Recovery device to factory settings: reset device to factory default, which needs to verify admin password.
Reboot	Restart the device immediately.
Upgrade	Click the folder icon and select the upgrading file, then click the **Upgrade** button to upgrade. The update will be done when the system reboots successfully. **Note:** The upgrade process takes about 1-10 minutes. Do not turn off the power and complete automatic restart after the upgrade.
Backup and Restore	**Export Config File:** Export configuration file.
	Import Config File: Click the file icon and select the configuration file, click **Import** button to import configuration file.

6. Installation Instruction

Parameter definition:

Parameters	Explanation	Value
H	Installation height	2.2 ~ 6 m
h	Target height	Example 1.7 m
α	Horizontal field of view angle	
β	Vertical field of view angle	
x	Length of detection range	
y	Width of detection range	

α and β are related to installation height:

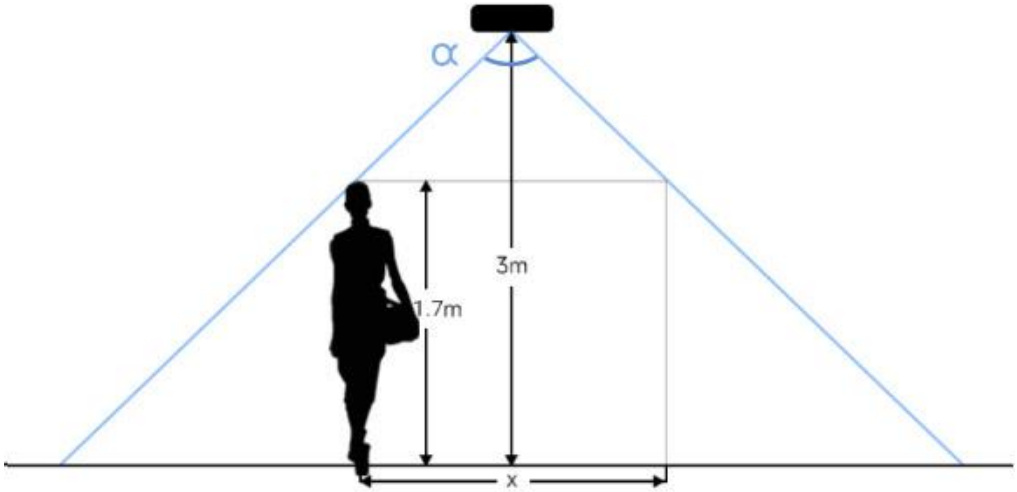
Installation Height / m	α	β
0~3	103°	77°
3.001 ~ 4	94°	68°
4.001 ~ 5	89°	58°

5.001 ~ 6	62°	41°

6.1 Covered Detection Area

The detection area covered by the device is related to the field of view angle of the device, the installation height and the target height.

The length of the detection area is approximately x=2 × tan(α/2) × (H-h-0.05) and the width of the detection area is approximately y=2 × tan(β/2) × (H-h-0.05).



For example, if the pedestrians' height is 1.7 m, the detection area corresponding to each installation height is as follows:

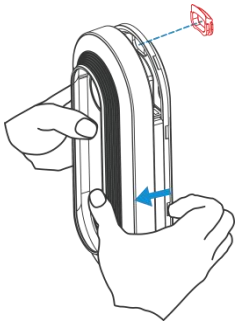
Installation Height (m)	Detection Area (m)
2.2	1.38 × 0.87
2.4	1.88 × 1.20
2.6	2.39 × 1.51
2.8	2.89 × 1.83
3.0	3.39 × 2.15
3.2	3.33 × 2.07
3.4	3.76 × 2.34
3.6	4.19 × 2.61
3.8	4.62 × 2.88
4.0	5.05 × 3.14
4.5	5.61 × 3.16
5.0	6.60 × 3.72
5.5	4.65 × 2.90
6.0	5.25 × 3.28

6.2 Installation

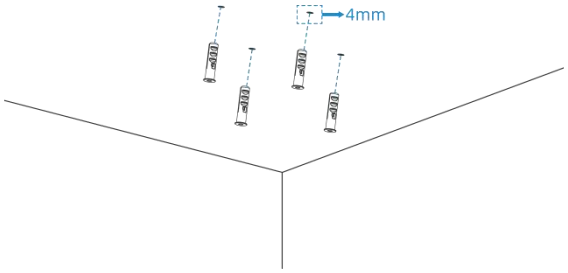
Ceiling Mount

Installation condition: ceiling thickness > 30mm.

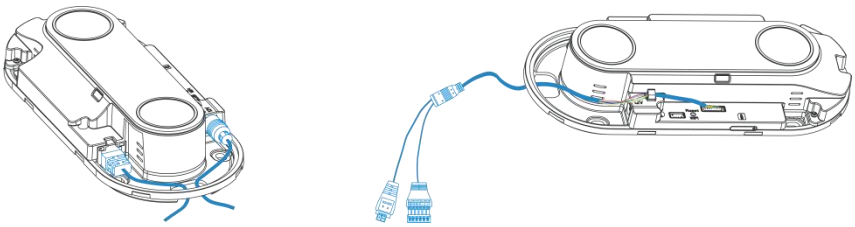
Step 1: Remove the cover. (If the wires need to be protruded from the side of the device, remove the blocking rubber.)



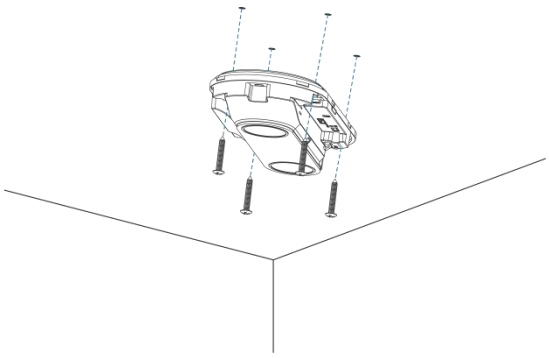
Step 2: Drill 4 holes with a diameter of 4mm according to the hole position of the device screw. (If you need to hide the power cord into the ceiling, drill another wire hole.) Attach the expansion bolts to the hole position in the ceiling.



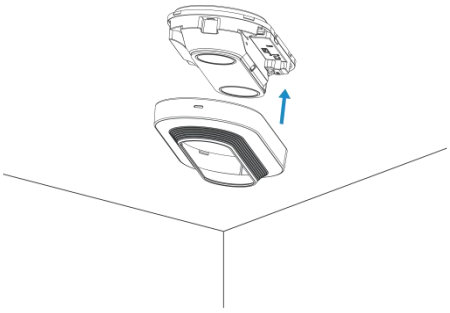
Step 3: Connect all required wires, and pass them through the wire holes behind the device.(If the alarm I/O is going to be used, please connect the Multi-interface to the device.)



Step 4: Fix the device to the wall plugs via mounting screws.



Step 5: Fix the cover back to device.



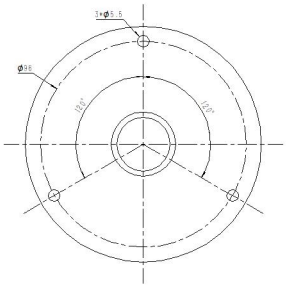
Ceiling/Lintel Mount (with Optional VB01 Multifunctional Bracket)

Step 1: Fix the pole to the device with the hole on the device.

Step 2: Adjust the length of the pole, then adjust the direction of 3-axis ball and tighten it with the handle.

Step 3: Determine the mounting location and drill 3 holes, fix the wall plugs into the mounting holes, then fix the bracket base to the wall plugs via mounting screws.

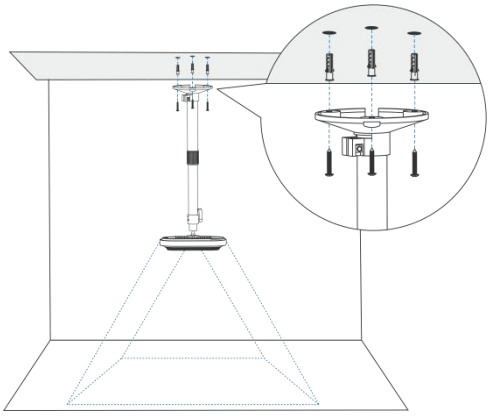
(**Note:** If the wire needs to be extended to the interior of the ceiling or wall, a wire hole with a suitable size is also required to be drilled.)



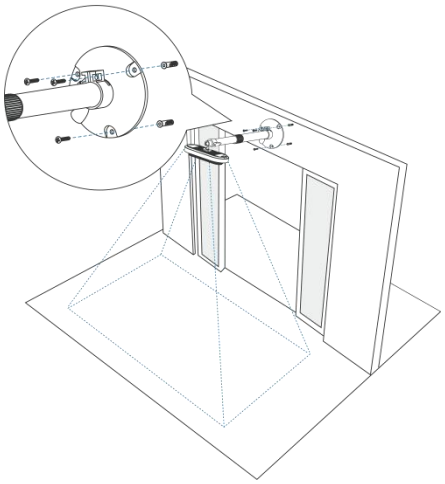
Step 4: Remove the cover on the device, and then connect all required wires and pass them through the inside of pole.

Step 5: Fix the pole to bracket base with screws and nuts.

- **Ceiling Mount**

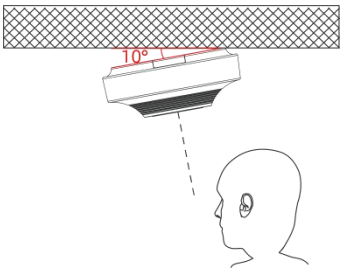


- **Lintel Mount**



Installation Note:

- The device is sensitive to ambient light, so it's best to avoid placing it in areas where light conditions fluctuate significantly.
- Make sure there are no obstacles within the live view of device.
- When the device is installed on the door frame or door, it is recommended to use VB01 or other bracket to make the device is above 30cm from the door with enough time to capture the target.
- When the device is installed at the door of the fan switch, the device needs to be installed on the opposite side of the door.
- For more accurate target attribute detection, tilt the device slightly (within 10 degrees).



6.3 Factors Affecting Accuracy

- The device can not recognize well if the ground is smooth and lacks patterns.
- It is indistinguishable when the color of targets and the floor is similar.

7. Communication Protocol

VS125 will post the people counting data in json format to HTTP URL or MQTT broker.

7.1 Periodic Report


```
{
    "device_info":
    {
        "cus_device_id": "123456",
        "cus_site_id": "789123",
        "device_mac": "24:E1:24:FA:0C:6C",
        "device_name": "People Counter",
        "device_sn": "6384E16179950009",
        "firmware_version": "V_125.1.0.1,
        "hardware_version": "V1.0",
        "ip_address": "192.168.60.183",
        "running_time": 141
    },
    "network_info": //Cellular version only
    {
        "network_status": "true",     //True is connected, False is disconnected
        "iccid": "89860117838009934120",
        "imei": "860425047368939",
        "cell_id": "340db80",
        "lac": "5299"
    },

    "line_periodic_data":
    [
        {
            "children_in": 0,
            "children_out": 0,
            "female_in": 1,
            "female_out": 1,
```

```
            "in": 1,
            "line": 1,
            "line_name": "Line1",
            "line_uuid": "9a0440de-3188-4f6d-b886-bb20c97bd26b",
            "male_in": 0,
            "male_out": 0,
            "out": 1
        },
        {
            "children_in": 0,
            "children_out": 0,
            "female_in": 1,
            "female_out": 1,
            "in": 1,
            "line": 2,
            "line_name": "Line2",
            "line_uuid": "b138b9a1-ce58-40bd-98f4-c401dfc118c8",
            "male_in": 0,
            "male_out": 0,
            "out": 1
        }
    ],
    "line_total_data":
    [
        {
            "capacity_counted": 4,
            "children_in_counted": 0,
            "children_out_counted": 0,
            "female_in_counted": 0,
            "female_out_counted": 0,
            "in_counted": 29,
            "line": 1,
            "line_name": "Line1",
            "line_uuid": "9a0440de-3188-4f6d-b886-bb20c97bd26b",
            "male_in_counted": 29,
            "male_out_counted": 33,
            "out_counted": 33
        },
```

```
        {
            "capacity_counted": 5,
            "children_in_counted": 0,
            "children_out_counted": 0,
            "female_in_counted": 0,
            "female_out_counted": 0,
            "in_counted": 39,
            "line": 2,
            "line_name": "Line2",
            "line_uuid": "b138b9a1-ce58-40bd-98f4-c401dfc118c8",
            "male_in_counted": 39,
            "male_out_counted": 44,
            "out_counted": 44
        }
    ],
    "region_data":
    {
        "dwell_time_data":
        [
            {
                "avg_dwell_time": 308367,
                "children_avg_dwell_time": 0,
                "children_max_dwell_time": 0,
                "female_avg_dwell_time": 0,
                "female_max_dwell_time": 519934,
                "male_avg_dwell_time": 0,
                "male_max_dwell_time": 96799,
                "max_dwell_time": 519934,
                "region": 1,
                "region_name": "Region1",
                "region_uuid": "bd1e6ce2-e113-4ce4-a9b6-0633f7083cac"
            },
            {
                "avg_dwell_time": 0,
                "children_avg_dwell_time": 0,
                "children_max_dwell_time": 0,
                "female_avg_dwell_time": 0,
                "female_max_dwell_time": 0,
```

```
                "male_avg_dwell_time": 0,
                "male_max_dwell_time": 0,
                "max_dwell_time": 0,
                "region": 2,
                "region_name": "Region2",
                "region_uuid": "f16a2618-f44a-485d-8b4e-d7550a155b8e"
            }
        ],
        "region_count_data":
        [
            {
                "current_children": 0,
                "current_female": 0,
                "current_male": 3,
                "current_total": 3,
                "region": 1,
                "region_name": "Region1",
                "region_uuid": "bd1e6ce2-e113-4ce4-a9b6-0633f7083cac"
            },
            {
                "current_children": 0,
                "current_female": 0,
                "current_male": 0,
                "current_total": 0,
                "region": 2,
                "region_name": "Region2",
                "region_uuid": "f16a2618-f44a-485d-8b4e-d7550a155b8e"
            }
        ]
    },
    "time_info":
    {
        "dst_status": false,
        "enable_dst": true,
        "end_time": "2024-05-30T20:21:49+08:00",
        "start_time": "2024-05-30T20:20:49+08:00",
        "time_zone": "UTC+8:00 China Standard Time (CT/CST)"
    }
```

}

7.2 Trigger Report-Line Crossing People Counting


```
{
    "device_info":
    {
        "cus_device_id": "123456",
        "cus_site_id": "789123",
        "device_mac": "24:E1:24:FA:0C:6C",
        "device_name": "People Counter",
        "device_sn": "6384E16179950009",
        "firmware_version": "V_125.1.0.1",
        "hardware_version": "V1.0",
        "ip_address": "192.168.60.183",
        "running_time": 58
    },
    "network_info": //Cellular version only
    {
        "network_status": "true",     //True is connected, False is disconnected
        "iccid": "89860117838009934120",
        "imei": "860425047368939",
        "cell_id": "340db80",
        "lac": "5299"
    },
    "line_trigger_data":
    [
        {
            "children_in": 0,
            "children_out": 0,
            "female_in": 0,
            "female_out": 0,
            "in": 1,
            "line": 1,
            "line_name": "Line1",
            "line_uuid": "9a0440de-3188-4f6d-b886-bb20c97bd26b",
            "male_in": 1,
            "male_out": 0,
            "out": 0
```

```
        },
        {
            "children_in": 0,
            "children_out": 0,
            "female_in": 0,
            "female_out": 0,
            "in": 1,
            "line": 3,
            "line_name": "Line3",
            "line_uuid": "82ffe54d-0191-484b-a2fc-495628a8f2a1",
            "male_in": 1,
            "male_out": 0,
            "out": 0
        },
        {
            "children_in": 0,
            "children_out": 0,
            "female_in": 0,
            "female_out": 0,
            "in": 1,
            "line": 4,
            "line_name": "Line4",
            "line_uuid": "ebc7b502-08d6-4f61-b704-e02d1938b9e2",
            "male_in": 1,
            "male_out": 0,
            "out": 0
        }
    ],
    "time_info":
    {
        "dst_status": false,
        "enable_dst": true,
        "time": "2024-05-30T20:11:32+08:00",
        "time_zone": "UTC+8:00 China Standard Time (CT/CST)"
    }
}
```


7.3 Trigger Report-Region People Counting


```
{
```

```
"device_info":
{
    "cus_device_id": "123456",
    "cus_site_id": "789123",
    "device_mac": "24:E1:24:FA:0C:6C",
    "device_name": "People Counter",
    "device_sn": "6384E16179950009",
    "firmware_version": "V_125.1.0.1",
    "hardware_version": "V1.0",
    "ip_address": "192.168.60.183",
    "running_time": 105
},
"network_info": //Cellular version only
{
    "network_status": "true",     ////True is connected, False is disconnected
    "iccid": "89860117838009934120",
    "imei": "860425047368939",
    "cell_id": "340db80",
    "lac": "5299"
},

"region_trigger_data":
{
    "region_count_data":
    [
        {
        "current_children": 0,
        "current_female": 0,
        "current_male": 2,
        "current_total": 2,
        "region": 1,
        "region_name": "Region1",
        "region_uuid": "bd1e6ce2-e113-4ce4-a9b6-0633f7083cac"
        }
    ]
},
"time_info":
{
```

```
        "dst_status": false,
        "enable_dst": true,
        "time": "2024-05-30T20:12:20+08:00",
        "time_zone": "UTC+8:00 China Standard Time (CT/CST)"
    }
}
```


7.4 Trigger Report-Dwell Time Detection


```
{
    "device_info":
    {
        "cus_device_id": "123456",
        "cus_site_id": "789123",
        "device_mac": "24:E1:24:FA:0C:6C",
        "device_name": "People Counter",
        "device_sn": "6384E16179950009",
        "firmware_version": "V_125.1.0.1",
        "hardware_version": "V1.0",
        "ip_address": "192.168.60.183",
        "running_time": 106
    },
    "network_info": //Cellular version only
    {
        "network_status": "true",    ////True is connected, False is disconnected
        "iccid": "89860117838009934120",
        "imei": "860425047368939",
        "cell_id": "340db80",
        "lac": "5299"
    },

    "region_trigger_data":
    {
        "dwell_time_data":
        [
            {
            "children": false,
            "duration": 96799,
            "dwell_end_time": "2024-05-30T20:12:20+08:00",
            "dwell_start_time": "2024-05-30T20:10:43+08:00",
```

```
                "people_id": 5,
                "region": 1,
                "region_name": "Region1",
                "region_uuid": "bd1e6ce2-e113-4ce4-a9b6-0633f7083cac",
                "sex": "male"
                }
            ]
        },
        "time_info":
        {
            "dst_status": false,
            "enable_dst": true,
            "time": "2024-05-30T20:12:20+08:00",
            "time_zone": "UTC+8:00 China Standard Time (CT/CST)"
        }
}
```


-END-