

# 3D ToF People Counting Sensor Featuring LoRaWAN® VS132

User Guide



#### **Safety Precautions**

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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 components which may be hot.
- 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**

VS132 is in conformity with the essential requirements and other relevant provisions of the CE, FCC, and RoHS.



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## **Revision History**

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Date	Doc Version	Description
Oct. 15, 2022	V 1.0	Initial version
		1. Support U-turn counting;
Dec 6 2022	V 1 1	2. Support Milesight DeviceHub Management
Dec. 6, 2022	V 1.1	3. Delete LoRaWAN version V1.1.0 option
		4. Add counting clear downlink command

# Contents

1. Product Introduction	;
1.1 Overview	;
1.2 Key Features	;
2. Hardware Introduction	;
2.1 Packing List5	;
2.2 Hardware Overview	,
2.3 Ethernet Port Indicators	,
2.4 Dimensions (mm)6	)
3. Power Supply	,
4. Access the Sensor	'
4.1 Access with Wi-Fi	'
4.2 Access with Ethernet	;
5. Operation Guide	)
5.1 Preview	)
5.2 Configuration10	)
5.2.1 Rule	)
5.2.2 Traffic	)
5.2.3 Communication	)
5.2.4 System17	,
6. Installation Instruction	)
6.1 Installation Height21	
6.2 Covered Detection Area21	
6.3 Environment Requirements 21	
6.4 Installation 22	)
6.5 Factors Affecting Accuracy24	┝
7. Device Payload	ŀ
7.1 Uplink Data24	ŀ
7.2 Downlink Command25	;

# **1. Product Introduction**

#### 1.1 Overview

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VS132 is a LoRaWAN<sup>®</sup> 3D ToF people counting sensor designed to count the number of people entering and exiting. Applied the most advanced Time-of-Flight technology, VS132 only obtains depth maps instead of images to protect privacy and provide a high level of accuracy up to 99.5%. Cooperating with Milesight LoRaWAN<sup>®</sup> gateway and the Milesight IoT Cloud, it allows users to monitor the flow of people and trigger linkage to control other devices via browser or mobile App remotely. VS132 can be widely used in entrances or corridors of retail stores, malls, offices, subways, etc.

## **1.2 Key Features**

- Up to 99.5% accuracy basing on advanced 3D Time-of-Flight technology
- Obtain depth map without images capturing, free from privacy concerns
- Effective in low-light or complete dark environments
- Bi-directional Counting
- Store a million data records locally
- DC or PoE power supply optional
- Exquisite design for multiple installation scenarios
- Equipped with Wi-Fi and Ethernet port for web GUI configuration
- Acquire people counting data either from LoRaWAN<sup>®</sup> or Ethernet port (CGI)
- Function well with standard LoRaWAN<sup>®</sup> gateways and network servers
- Quick and easy management with Milesight IoT Cloud

## 2. Hardware Introduction

## 2.1 Packing List









1 × VS132 Device

1 × Power Adapter

2 × Ear Mounting Kits

4 × Wall Mounting

Kits





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

## 2.2 Hardware Overview



Threaded Hole (UNC 1/4-20)

## 2.3 Ethernet Port Indicators

Indicator	Status	Description
	Off	Disconnected
Link Indicator (Orange)	Blinking	Transmitting data
	On	Connected
Data Indiantar (Croon)	Off	100 Mbps mode
Rate mulcator (Green)	On	10 Mbps mode

## 2.4 Dimensions (mm)



# 3. Power Supply

VS132 can be powered by 802.3at standard PoE or power adapter (12VDC, 2A). If the both interfaces are connected, the device will be powered by the former method (PoE).



#### 4. Access the Sensor

VS132 sensor provides user-friendly web GUI for configuration and users can access it via Wi-Fi connection or Ethernet port. The recommended browsers are Internet Explorer, Firefox, Chrome, Microsoft Edge, and Safari. The default IP of Ethernet port is **192.168.5.220**, the default IP of Wi-Fi is **192.168.1.1**, and default SSID is **People Counter\_XXXXXX**.

Note: The default information can be found on the label.

## 4.1 Access with Wi-Fi

Step 1: Power on the device.

Step 2: Enable the Wireless Network Connection on your computer and search for corresponding access point, then connect computer to this access point.

Step 3: Open the Browser and type 192.168.1.1 to access the web GUI.

Step 4: Select the language.

Step 5: Users need to set the password and three security questions when using the sensor for the first time (three questions can be skipped by refreshing webpage). 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.

		Sector Sector	Language English 👻
	Activation Username Password Password Confirmation	admin B-16, only two kinds or more in combination with numbers, lowercase letters, uppercase letters, special characters DOME	
		Set and the set of the	Language English 💌
Section	Ity Configuration Issues Security Question 1 Answer Security Question2 Answer Security Question3 Answer	What are your favorite games   What is your favorite book  What's your favorite color  OK	

## 4.2 Access with Ethernet

Step 1: Power on the device and connect the Ethernet port to a PC.

Step 2: 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).

	uner / Heavork and Internet / Heavork and	a sharing center
Control Panel Home	View your basic network inform	nation and set up connections
	View your active networks	
Change adapter settings		
Change advanced sharing	Milesight 5G	Access type: Internet
settings	Public network	Connections: Q Ethernet
Media streaming options		
	Change your networking settings	🗍 Ethernet
	Set up a new connection or net	work
	Set up a broadband, dial-up, or	VPN connection; or set up a router or access point.
	Troubleshoot problems	
	Diagnose and repair network pr	roblems, or get troubleshooting information.

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 existing network);

eneral	
You can get IP settings assign	ed automatically if your network supports
this capability. Otherwise, you	need to ask your network administrator
for the appropriate in securitys	•
Obtain an IP address aut	omatically
• Use the following IP addr	ess:
IP address:	192 168 5 61
i duicas.	152.100.5.01
S <u>u</u> bnet mask:	255.255.255.0
Default gateway:	192 . 168 . 5 . 220
Obtain DNS server addre	ss automatically
• Use the following DNS se	rver addresses:
Preferred DNS server:	8.8.8.8
Alkanaka DNG anna	
Alternate DNS server:	· · ·
	1-
	xit

Step 3: Open the Browser and type 192.168.5.220 to access the web GUI. After logging on web GUI successfully, user is allowed to view configuration page.

# 5. Operation Guide

#### 5.1 Preview

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



Parameters	Description
Reset Count	Clear accumulated entrance and exit people counting values.

Enable Tracks

When enabled, there is tracking line when people pass the detection area.

## 5.2 Configuration

## 5.2.1 Rule

# **Rule Configuration**

Users can set the rules and ROI to ensure accurate counting.

Q Rule	Rule Configuration	Pass Area ROI	
Traffic	Deploy Height	3000	mm(1500~3000)
Communication	Deploy Angle	0	° (-10~10)
System	Max Target Height	2000	mm(500~2500)
	Min Target Height	1000	mm(500~2500)
	U-turns Counting		
	Periodic Report		
	Period	1	min(1~1080)
	Save		

Parameters	Description	
Deploy Height	Set the device deploy height from the ground.	
Deploy Angle	Set the deploy angle based on horizontal surface. Mitesight	
Max Target Height	Set the maximum target height, then the device will ignore the object higher than this height.	
Min Target Height	Set the minimum target height, then the device will ignore the object shorter than this height.	
U-turns Counting	When enabled, the device will count the in and out values repeatedly if people wandering between the two areas; when disabled, the device will only count when people pass from one area to another area and get out of device sight.	



Periodic Report	Report the people counting data via LoRaWAN® periodically.
Period	Set the period of reporting periodic report.
	Range: 1-1080 mins, default: 30 mins

**Note:** Due to the error in ToF distance measurement (0.05 m), the Max Target Height should be set as maximum pedestrian height plus 0.05 m and the Min Target Height as minimal pedestrian height minus 0.05 m in the actual applications. For example, if the pedestrian height is 1.6 m to 1.8 m, the Max and Min Target Height should be configured as 1.85 m and 1.55 m respectively.

#### **Pass Area ROI**

Region of interest (often abbreviate ROI), is a selected subset of samples within a dataset identified for a particular purpose. Users can select entrance area and exit area to record the people count values which indicate the number of people passing from one area to another. Step 1: Click **Set Entrance Area** or **Set Exit Area**.

Step 2: Drag the mouse to draw detection area. If there is already an area, you can click **Clear**. Step 3: Click **Stop Drawing**, then click **Save**.





**Note:** The detection area had better not fill the field of view, leaving a certain interspace.

#### 5.2.2 Traffic

The sensor will count the number of people who passing from one area to another, then upload the count value according to the reporting interval. Before using this feature, ensure the device time is correct on **System > Time Configuration** page.

<b>M</b> ilesight	Preview Configuration	🛓 admin	[→ Logout
Rule Traffic Communication	Count Type     by hour >       Time Picker     2022-09-27       Count     Export     Clear all		
System	2022-09-27 enter leave -O- inside		
	0.4		
		0:00 21:00 2	2:00 23:00

Parameters	Description
Count Type	Select the count type to generate the graph.
Time Picker	Select the time or time range to generate the graph.
Count	Click to generate the graph according to picked time or time range.
Export	Export the historical traffic data as csv file. The recorded and saved time is fixed by hour.
Clear all	Click to clear all saved data records.

#### 5.2.3 Communication

#### 5.2.3.1 Ethernet

VS132 provides a Ethernet port for wired access. Besides, users can get the people counting data or configure the device via CGI. For CGI document, please contact with Milesight IoT support: iot.support@milesight.com.

Pv4 Address	192.168.5.220	Test
Pv4 Subnet Mask	255.255.255.0	
Pv4 Default Gateway	192.168.5.1	
Preferred DNS Server	8.8.8.8	
Alternate DNS Server		
VAC Address	00:15:18:10:E0:6C	
UTU	1500	bytes

Parameters	Description	
IPv4 Address	Set the IPv4 address of the Ethernet port, the default IP is 192.168.	
IPv4 Subnet Netmask	Set the Netmask for the Ethernet port.	
IPv4 Default Gateway	Set the gateway for the Ethernet port's IPv4 address.	
Preferred DNS Server	Set the primary IPv4 DNS server.	
Alternative DNS	Set the accordery IDVA DNS conver	
Server	Set the secondary IPv4 DNS server.	
MAC Address	Display the MAC address of the Ethernet port.	
MTU	Display the maximum transmission unit.	
Test	Click to test if the IP is conflicting.	

#### 5.2.3.2 WLAN

Ethernet WLAN LoRa

WLAN		
Enable		
Work Mode	AP	~
SSID	People Counter_10E136	
Protocol	802.11n (2.4G)	~
Bandwidth	20MHz	~
Channel	Auto	~
Security Mode	No Encryption	~

DHCP Server Setting	S	
LAN IP Address	192.168.1.1	
Netmask	255.255.255.0	
Start Address	192.168.1.100	
End Address	192.168.1.199	
Lease Time	1440	min(5~1440)
Preferred DNS Server	8.8.8.8	
Alternate DNS Server	1	

Parameters	Description	
Enable	Enable Wi-Fi feature.	
Work Mode	Work mode is fixed as AP and can not connect to other access point.	
SSID	The unique name for this device Wi-Fi access point.	
Protocol	802.11b (2.4 GHz), 802.11g (2.4 GHz), 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, WEP Open System, WEP Shared Key, WPA-PSK, WPA2-PSK	
	and WPA-PSK/WPA2-PSK are optional.	
	LAN IP Address: IP address that used to access the web GUI of sensor.	
	Netmask: identify the subnet where the sensor is located.	
	Start Address: define the beginning of IP address pool which assigns to DHCP	
	clients.	
DHCP Server	End Address: define the end of IP address pool which assigns to DHCP clients.	
Settings	Lease Time (min): the lease time on which DHCP client can use the IP address	
	assigned by the sensor.	
	Preferred DNS Server: translate the domain name to IP address.	
	Alternate DNS Server: backup DNS server.	

#### 5.2.3.3 LoRa

LoRa settings are used for configuring the transmission parameters in LoRaWAN® network.

Ethernet WLAN	LoRa	
Join Status	De-activated	
Device EUI	24E124600C243505	
App EUI	24E124C0002A0001	
Application Port	85	
Join Type	OTAA	~
Application Key	•••••	> <sub>77</sub> 4
LoRaWAN Version	V1.0.3	~
Region	AU915	~
RX2 Data Rate	DR8 (SF12, 500k)	~
RX2 Frequency	923.3	
Enable Channel Index	(!) 0-71	

Channel List		
Index	Frequecy/MHz	
0- <mark>1</mark> 5	915.2-918.2	
16-31	918.4-921.4	
32-47	921.6-924.6	
48-63	924.8-927.8	
64-71	915.9-927.1	

Confirm Mode		
Rejoin Mode	<b>V</b>	
Set the number of detection	cti 8	
ADR Mode		
Spreading Factor	SF10-DR2	~

Parameters	Description	
Join Status	LoRaWAN <sup>®</sup> network joining status of this device.	
Device EUI	Unique ID of the device, which can also be found on the label.	
App EUI	The Default App EUI is 24E124C0002A0001.	
Application Port	The port used for sending and receiving data, default port is 85.	
Join Type	OTAA and ABP mode are available.	
	Appkey for OTAA mode, the default key is	
Application Key	5572404C696E6B4C6F52613230313823.	
Device Address	DevAddr for ABP mode, the default address is the 5 <sup>th</sup> to 12 <sup>th</sup> digits of SN.	
Network Session	Nwkskey for ABP mode, the default key is	

Key	5572404C696E6B4C6F52613230313823.	
Application	Appskey for ABP mode, the default key is	
Session Key	5572404C696E6B4C6F52613230313823.	
LoRaWAN Version	V1.0.2, V1.0.3 are available.	
Region	Frequency plan of this device.	
Channel	Select the channel from channel list or enter the index to select the frequency channel. Index examples: 1, 40: Enabling Channel 1 and Channel 40 1-40: Enabling Channel 1 to Channel 40 1-40, 60: Enabling Channel 1 to Channel 40 and Channel 60 All: Enabling all channels	
RX2 Data Rate	RX2 data rate to receive downlinks.	
RX2 Frequency/MHz	RX2 frequency to receive downlinks.	
Confirm Mode	If the device does not receive ACK packet from network server, it will resend data once.	
Rejoin Mode	Reporting interval ≤ 30 mins: the device will send a specific number of LinkCheckReq MAC packets to the network server every 30 mins to validate connectivity; If there is no response, the device will re-join the network. Reporting interval > 30 mins: the device will send a specific number of LinkCheckReq MAC packets to the network server every reporting interval to validate connectivity; If there is no response, the device will re-join the network	
ADR Mode	Allow network server to adjust data rate of the device.	
Spreading Factor	If ADR is disabled, the device will send data via this spreading factor.	

#### Note:

- 1) Please contact sales for device EUI list if there are many units.
- 2) Please contact sales if you need random App keys before purchase.
- 3) Only OTAA mode supports rejoin mode.
- 4) For -868M model, default frequency is EU868; for -915M model, default frequency is AU915.

# 5.2.4 System

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## **Basic Information**

All information about the hardware and software can be checked on this page.

Device Name	People Counter	
Product Model	VS132-915M	
SN	6600C2435050	
Hardware Version	V1.2	
Software Version	V_132.1.0.1-a5-b	
WLAN MAC Address	00:15:18:10:e1:36	
Ethernet MAC Address	00:15:18:10:e0:6c	

## **Time Configuration**

Time Zone	(GMT + 00: 00) Dublin, Edinburgh, London 🗸	
NTP Timing		
NTP Timing		
Server Address		
NTP Port	123	
Time Interval	480	min(1~10080)
Manual Timing		
Manual Timing		
Device Time	2000-01-01 00:36:44	
Setting Time		Synchronize with your computer time

Parameters	Description		
Time Zone	Choose the time zone for your location.		
NTP Timing	Sync the time with NTP server.		
Time Interval	Set the interval to sync time with NTP server.		
Manual Timing	Set the device time manually.		
Synchronize with			
computer time	Synchronize the time with your computer.		

# **User Management**

User List		Security Question Modify	
No.	Username	User Type	
1	admin	Administrator	

Parameters		Description	
	Click to type administ device. In case that y button on login page questions correctly.	rator password, then set three security question you forget the password, you can click <b>Forget</b> e to reset the password by answering three	is for your <b>Password</b> e security
	Security Configuration	on Issues	
	Security Question1	What are your favorite games	~
	Answer		
	Security Question2	What is your favorite book	~
	Answer		
	Security Question3	What's your favorite color	<b>~</b> ]
Security	Answer		
Question		OK	Cancel
	There are fifteen defau What are you What is your What's your What's your What is your What is your What is your What is your What is your What is the n What is your are The most infl Who is your What is your	ult questions below: <b>ar favorite games</b> favorite book favorite color favorite movie favorite flower first mobile phone brand ou go on your first plane ride father's name mother's name mother's name name of your high school teacher name of your junior high school teacher e most familiar name is roommates school dormitory luential name of the person you favorite celebrity favorite car brand	
Modify	Click the admin on the password of this device	e user list, then you can click Modify to change ce.	e the login

Username	admin
User Type	Administrator
Administrator Password	
Password	
	0.46 only two kinds or more in
	combination with numbers,
	special characters
Password Confirmation	1

#### **Remote Management**

You can connect the device to the Milesight DeviceHub management platform on this page so as to manage the device centrally and remotely. For more details, please refer to <u>DeviceHub</u> <u>User Guide</u>. Before connecting, ensure the device has connected to network via Ethernet port and Internet connection is seamless.

01-1-2	Discounted	
Status	Disconnected	
Server Address	192.168.60.228	
Activation Method	Account	~
Account Name		
Password		

Connect

	1			
Parameters	Description			
Status	Show the connection status between the device and the DeviceHub.			
Disconnect	Click this button to disconnect the device from the DeviceHub.         DeviceHub         Status       Connected       Disconnect         Server Address       192.168.60.228       Disconnect			
Server Address	IP address or don	nain of the DeviceH	ub management server.	
Activation Method	Select activation method to connect the device to the DeviceHub server, options are <b>Authentication Code</b> and <b>Account</b> .			

## **System Maintenance**

nguage	English V	
Reboot		
Reboot	Restart the device.	
Reset		
Basic Recovery	Recovery device basic configuration.	
All Recovery	Recovery device to factory settings.	
Upgrade		
pgrade Image	Browse Upgrade	

Explanation: The upgrade process takes 1-10 minutes, do not turn off the power, complete automatic restart after the upgrade.

Parameters	Description		
Language	English or simplified Chinese are optional.		
Reboot	Restart the device immediately.		
Reset	<ul><li>Basic Recovery: keep the IP settings, user information and stored counting data when resetting.</li><li>All Recovery: reset device to factory default, which needs to verify admin password.</li></ul>		
Upgrade	de Click the <b>Browse</b> button and select the upgrading file, then click the <b>Upgr</b> abutton to upgrade. The update is done when the system reboots successfull Note: The upgrade process takes about 1-10 minutes. Do not turn off the por and complete automatic restart after the upgrade.		

## 6. Installation Instruction

Parameter definition:

Parameters	Explanation	Value
Н	Installation height	≤3 m
d	Minimum detection distance of VS132	0.5 m
Δd	Distance measurement error of VS132	0.05 m
h <sub>max</sub>	Maximum pedestrian height	Example 1.8 m
h <sub>min</sub>	Minimum pedestrian height	Example 1.6 m
۵	ToF horizontal field of view angle	92.5°
β	ToF vertical field of view angle	67°
x	Length of detection range	
у	Width of detection range	

#### 6.1 Installation Height

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The maximum installation height is 3 m and the minimum installation height is  $h_{max}+d+\Delta d$ . For example, when the maximum pedestrian height is 1.8 m, then the minimum installation height is 1.8+0.5+0.05=2.35 m.

#### **6.2 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  $x=2.1\times(H-h_{min})$  and the width of the detection area is approximately  $y=1.32 \times (H-h_{min})$ .



For example, if the Minimum height of pedestrians is 1.6 m, the detection area corresponding to each installation height is as follows:

Installation Height	FoV Monitored Area (m)	Detection Area (m)
2.4	5.01 × 3.18	1.67 × 1.06
2.5	5.22 × 3.31	1.88 × 1.19
2.6	5.43 × 3.44	2.09 × 1.32
2.7	5.64 × 3.57	2.30 × 1.46
2.8	5.85 × 3.71	2.51 × 1.59
2.9	6.06 × 3.84	2.72 × 1.72
3.0	6.27 × 3.97	2.92 × 1.85

#### **6.3 Environment Requirements**

 Black floor/carpet may affect the depth map to produce a lot of noise, but will not affect the device to count people.



• Avoid direct point light to ToF sensor, which may result in incorrect counting.



• Outdoor sunlight shining on the over channel will not have an effect, but mirrored reflections that allow sunlight to shine on the ToF Sensor should be avoided.

#### 6.4 Installation

Step 1: Fix the two mounting ears to both side of the device with screws.

Step 2: Drill 4 holes on the ceiling or wall according to the mounting ear's hole and fix the wall plugs into the holes, then fix the device to wall plugs with mounting screws. When installing the device, it's suggested to fix the two screws on the top at first.

You can select the below mounting methods depending on the environment.

#### **Ceiling Mount**



## **Embedded Mount**

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## **Wall Mount**



Besides, the device can be mounted with the mounting stand via the threaded hole.



#### Note:

- Tilt installation should be avoided. Ensure that the front of the device and the ground plane parallel.
- Two devices should be avoided being installed too close since the ToF light from one device will affect count accuracy of the other device. The distance between two devices should be in accordance with the coverage without overlap.



• Avoid installing the device against the wall and ensure the device keep away from the wall at least 20cm. When installed on the door lintel, the device needs to be noted flush with the lower edge of the door frame.



#### 6.5 Factors Affecting Accuracy

- Wearing a fisherman's hat or carrying a cardboard box on the shoulder: The target will not be recognized because it will become unlike a human in depth map.
- Handheld or cart-carrying a humanoid doll with sufficient height to pass by: The doll will be mistakenly detected because it is sufficiently human-like in depth map.

# 7. Device Payload

All data are based on following format(HEX), the Data field should follow little-endian:

Channel1	Type1	Data1	Channel2	Type2	Data2	Channel 3	
1 Byte	1 Byte	N Bytes	1 Byte	1 Byte	M Bytes	1 Byte	

For decoder examples please find files on <u>https://github.com/Milesight-IoT/SensorDecoders</u>.

# 7.1 Uplink Data

VS132 reports basic information of sensor whenever joining the network and the number of people according to settings.

Channel	Туре	Description
ff	01 (Protocol Version)	01=> V1
	09 (Hardware Version)	01 04 => V1.4

	16 (Device SN)	16 digits
	1f (Software Version)	1f 07 00 4b => V31.7.0.75
03	d2 (accumulated counter)	Accumulated in counter, 4 bytes
04	d2 (accumulated counter)	Accumulated out counter, 4 bytes
05	cc (Periodic Counter)	Byte 1-2: in counter during the report interval
		Byte 3-4: out counter during the report interval

#### Example:

1. Device information

ff0101 ff166600b09409760000 ff090102 ff1f84010001					
Channel	Type Value Channel		Туре	Value	
ff	01 (Protocol Version)	01 (V1)	ff	16(Device SN)	66 00 b0 94 09 76 00 00
Channel	Туре	Value	Channel	Туре	Value
ff	09 (Hardware version)	0102 (V1.2)	ff	1f (Software version)	84 01 00 01 (V132.1.0.1)

#### 2. People counter

03d205000000 04d203000000 05cc02000100					
Channel	Туре	Value	Channel	Туре	Value
	d2			d2	03 00 00 00
03	(accumulated	05 00 00 00 =>	04	(accumulated	=> 00 00 00
	in counter)	00 00 00 03-3		out counter)	03=3
Channel	Туре	Value			
		In: 02 00 => 00			
05	cc (Periodic	02 = 2			
05	Counter)	Out: 01 00 => 00			
		01 =1			

# 7.2 Downlink Command

VS132 supports downlink commands to configure the device. Application port is 85 by default.

Channel	Туре	Description
ff	10 (Reboot)	ff (Reserved)

04 (Confirm Mode)	00: disable, 01: enable
	Byte 1: Channel index range
	01: 0-15
	02: 16-31
	03: 32-47
05 (LoRaWAN® Channel Mask)	04: 48-63
	05: 64-79
	06: 80-95
	Byte 2-3: indicate disable or enable via every
	bit, 0=disable, 1=enable
40 (ADR)	00: disable, 01: enable
41 (Application Port)	1 Byte, default is 85
42 (Wi-Fi)	00: disable, 01: enable
43 (People Counting Periodic	00 dischla 01 snahla
Report)	
51 (Clear the accumulated	ff (Decenved)
counting)	
6f (Reporting Interval)	2 Bytes, range: 1 ~ 1080 min, unit: min

**Note:** After changing any parameter of LoRaWAN<sup>®</sup> setting, the device will re-join the network.

#### Example:

1. Disable Wi-Fi.

ff4200				
Channel	Туре	Value		
ff	42 (Wi-Fi)	00: disable		

2. Set AU915 or US915 channel mask as 8-15.

ff0501ff00 ff05020000 ff05030000 ff05040000 ff05050000			
Channel	Туре	Value	
<i>ff</i>	05	01: Channel index 0-15, ff00 => 8-15 is enabled	
11	(Set Channel Mask)	02-05: Channel index 16-79, 0000 => all disabled	

3. Reboot the device.

	ff10ff	
Channel Type Value		
ff	10 (Reboot)	ff (Reserved)

#### 4. Set reporting interval as 20 minutes.

ff6f1400			
Channel	Туре	Value	
ff	6f (Set Reporting Interval)	14 00 => 00 14 = 20 minutes	

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