

Multi-channel vibrating wire  
sensor wireless data logger  
VS10x/VS4xx (EUR)

user manual  
(V1.24 For HW2.01 SF3.00)

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## Declarations and warnings

Thank you for choosing our products!

Please read this document carefully before using this product. This statement has a significant impact on the safe use of this product and your legal rights.

Please be sure to operate the device on the basis of reading and understanding. There are dependencies in different chapters of this document. There is no guarantee that you can directly skip the necessary chapters and directly complete the functions of a chapter.

As a manufacturing company, the quality of the product we produce is safe and reliable, but we hope that the purchaser should fully understand the basic knowledge and common sense of sensing, electronics, automated measurement and control, computer and other technologies before starting to operate the equipment.

We do not promise that it will be compatible with all sensors and meet all your usage requirements and expectations.

This document is only a brief description of the basic operation instructions and precautions of the VS series. If you need to know all the detailed functions and specific operations of the equipment, you can read some other information. The extension information is as follows:

For detailed parameter (register) address definitions and descriptions, please refer to "VS Series logger Register Definition.pdf"

For the description of the communication protocol, please refer to the "Common Control Communication Device Interface Description.pdf"

For the use of the mail server-based monitoring platform software, please refer to the "Offline Cloud Monitoring System OCMS User Manual.pdf"

For specific operation instructions and operation examples of some special functions of the equipment, please feel free to contact the sales or technical staff.

This manual does not directly or indirectly constitute any commitment. On the basis of the purchaser's voluntary purchase, such as the damage or economic loss caused by the instrument during use, we do not bear any economic responsibility and legal responsibility as the manufacturer.

## Overview

VS101/104/208/416/432 is a multi-channel wireless data logger based on vibrating wire and temperature sensing signals, and can expand other analog (current, voltage, resistance) signals and digital signals (RS485, RS232) sensors. built-in battery, external solar panel. Up to 32 channels of fully automatic acquisition and storage and wireless transmission, support internal and external U disk storage; One power output can supply power to other sensors; RS232/RS485 data interface, industrial MODBUS or ABB simple communication protocol can be directly connected Into the existing measurement and control system (such as PLC, wireless transmission equipment, etc.); wireless network supports 2G/4G/NB\_IOT, WIFI, RF (Lora), the monitoring data can be sent remotely in the form of SMS, email, FTP file, TCP, etc. With the platform software OCMS of our company, the monitoring system can be easily and quickly completed through simple configuration, online monitoring, data viewing and data downloading. The cast aluminum box sturdy and durable, IP67-protected, and has an operating temperature of -40 to 85°C. It is especially suitable for harsh environments and requires no secondary protection.



VS101~432

## Main characteristics

- **Dimensions:**  
VS10X: 80mm\*75mm\*60mm  
VS4XX: 188mm\*120mm\*78mm
- **Material:** cast aluminum
- **Protection:** ip67
- **Power supply:** DC10~24V wide voltage @3A (built-in battery + solar panel)
- **Operating mode:**  
Real-time online: Serial output, TCP/RF real-time online  
Timing: 1 minute to 45 days configurable, can be sent in a single or scheduled daily, weekly, monthly.
- **Sending method:**  
Digital interface: RS232 or RS485 output, Modbus communication protocol

**Mobile phone network:** Sent to mobile phone, TCP server, E-mail, FTP server

**Self-built radio:** Send data to a computer within 5 km

- **Average power consumption:** 5uA standby, DC12V@10AH battery can be used for no less than half a month without solar charging (once per hour)
- **Storage space:** Can store no less than 2 years of data (storage once per hour)
- **Temperature range:** -40~85° C

Main performance parameters (if not specified, the following are measured at an ambient temperature of 25°C, VIN=12V)

Parameter	Condition	Min	Typical value	Max	Unit
<b>power supply</b>					
VIN		10	12	24	V
I <sub>WORK</sub>	Peak 2A	250	320	380	mA
I <sub>SLEEP</sub>			5		uA
<b>Vibrating wire (Frequency) sensor</b>					
Frequency range		100		8000	Hz
Excitation voltage	Low voltage sweep	3		20	V
	High voltage pulse	30		220	V
Frequency resolution			0.01		Hz
Frequency accuracy		0.01		0.05	Hz
Frequency measurement rate	High voltage pulse		1		S/CH
	Feedback sweep		1		S/CH
	Full frequency sweep			10	S/CH
<b>Temperature (Thermistor) sensor</b>					
Resistance range		1	2	10	KΩ
Temperature resolution			0.1		°C
Temperature accuracy			0.3		°C
<b>other</b>					
RTC Precision			2	3.5	ppm
Built-in storage			8	32	MByte
External storage	U disk		2G	32	G
Operating temperature		-40		+85	°C

## Order information

**VS** **A** **B** **C** **D** **E**

- VS: wireless vibrating wire sensor hair loss meter
- A: Number of embedded core measurement modules (1~4)
- B: number of vibrating wire channels represented by two digits (02, 04, 08, 16)
- C:t means with temperature measurement channel
- D: Is there an analog acquisition channel, v is the voltage signal, and i is the current signal.
- E: Communication interface type (2G, 4G, NB\_IOT, WIFI, RF, RS485, RS232)

Model Example

model	Vibrating wire channel	Temperature channel	Voltage (0~5V)	Current (0~20mA)	Descr
VS101T	1	1	0	0	Wireless network optional Lora, 2G, 4G
VS104T	2	2	0	0	
VS208T	8	8	0	0	
VS416T	16	16	0	0	
VS432	32	0	0	0	
VS432T	28	4	0	0	
VS000V	0	0	32	0	
VS000I	0	0	0	32	
VS208TV	8	8	16	0	
VS312TI	12	12	0	8	

Note: The wireless type defaults to the mobile phone wireless network, and the user needs to install the SIM card by self. Other wireless types must contact market personnel prior to purchase.

Note: The mobile phone network is divided into 2G and 4G and NB\_IOT, please confirm and purchase.

## Equipment List

- 1 host(including button battery)
- 1 power adapter (DC12v@2A)
- Power cable + data cable 1 (only VS10x)
- 1 power cable (4 cores) (VS208-VS432)
- 2 data cables (RS232 and RS485) (vs208-vs432)
- Sensor signal cables
- 1 antenna (1.5M)
- 18650 battery \* 3 (VS208-VS432)
- U disk (vs208-vs432)
- 1 set of accessories (4 screws, 4 fixed feet)

- 1 copy of the manual (this manual)
- 1 copy of the configuration software
- USB to RS232 conversion adapter (Optional)
- Battery charger (Optional)

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## Structure and Composition



## Interface Definition

VS10x interface definition - Power and Communication

	Line color	Line Name	Descr
power supply	Red	External input power positive	Connect the battery or power adapter. Do not connect external power when the device is equipped with a built-in battery.
	Black	External input power negative	
RS232	Blue	Data transmission TXD	Connect computer RS232 interface
	Green	Data reception RXD	
	Black	GND	
RS485	Gray	A/D+	Connected to the 485 bus
	White	B/D-	

VS101 interface definition - Sensor interface

	Line color	Line Name	Descr
<b>Vibrating wire</b>	Black	Vibrating wire	
	Red	channel 1	
	Blue	Temperature	
	Green	channel 1	

VS104 interface definition - Sensor interface

	Line color	Line Name	Descr
<b>Vibrating wire</b>	Black	Vibrating wire	4 vibrating wire sensors can be connected to each connector. Black line is the common of the vibrating wire White line is common of the temperature
	Red	channel 1	
	Black	Vibrating wire	
	Purple	channel 2	
	Black	Vibrating wire	Note: The common line is not GND. Do not connect the common line (black and white) to GND.
	Blue	channel 3	
	Black	Vibrating wire	
	Yellow	channel 4	
	White	Temperature	This product can only be connected to 2-wire or 4-wire vibrating wire sensors When the sensor is 3-wire, it is strictly forbidden to connect the temperature line.
	Green	channel 1	
	White	Temperature	
	Orange	channel 2	
	White	Temperature	
	Brown	channel 3	
	White	Temperature	
	Gray	channel 4	

Note: when the read frequency is not stable, Try to exchange the positive and negative terminals of the coil.

VS4xx interface definition - Power and Communication

	Line color	Line Name	Descr
<b>power supply</b>	Red	External input power positive	Connect the battery or power adapter. Do not connect external power when the device is equipped with a built-in battery.
	Black	External input power negative	
	Green	Charging input positive	Connect a solar panel or charger to charge the internal or external battery
	Blue	Charging input negative	
<b>RS232</b>	Blue	Data transmission TXD	Connect computer RS232 interface
	Green	Data reception RXD	
	Black	GND	
<b>RS485</b>	Red	Power output +	
	Black	Power Output -	
	Blue	A/D+	Connected to the 485 bus
	Green	B/D-	

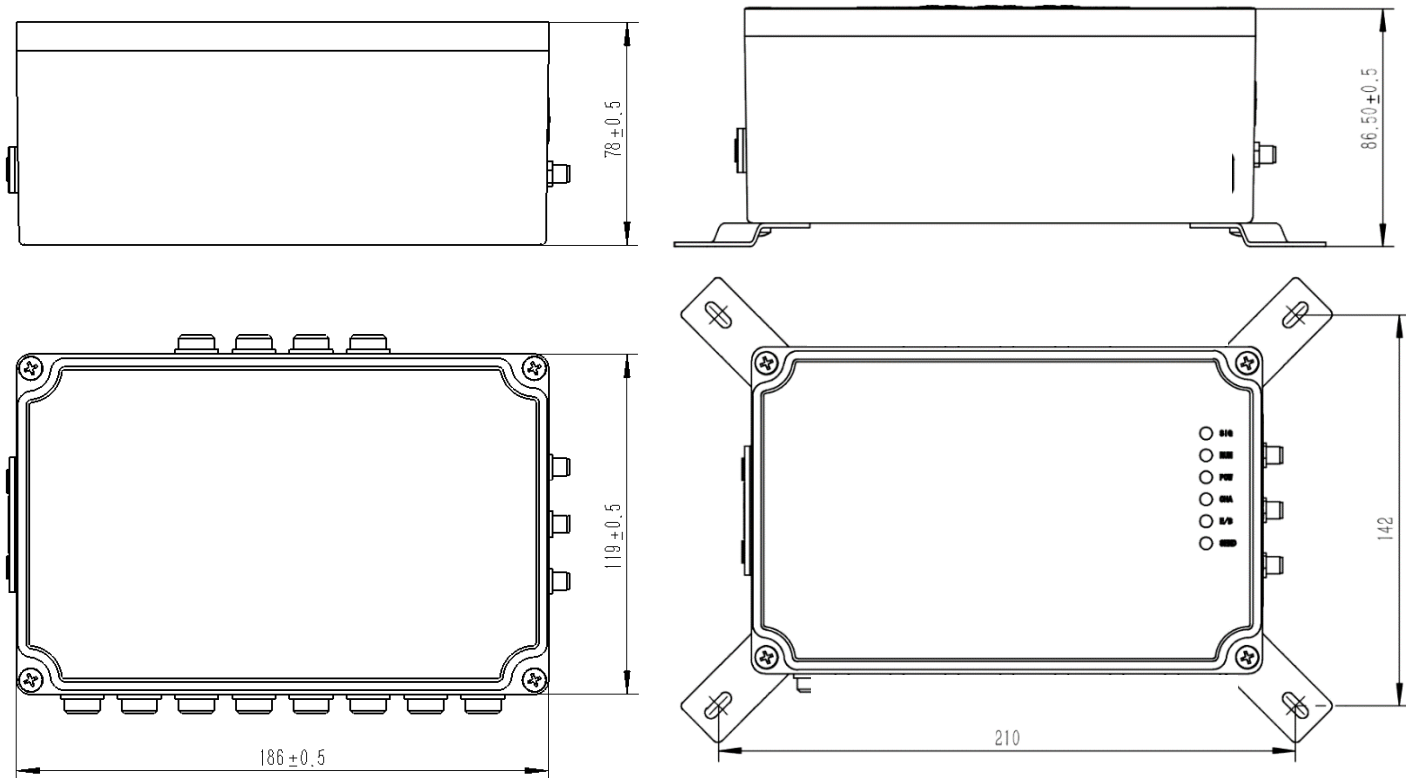
VS4xx interface definition - sensor interface

Identification	Line color	Line Name	Descr	
Vibrating wire	Black	Vibrating wire	4 vibrating wire sensors can be connected to each connector. Black line is the common of the vibrating wire White line is common of the temperature	
	Red	channel 1		
	Black	Vibrating wire		
	Purple	channel 2		
	Black	Vibrating wire		
	Blue	channel 3		
	Black	Vibrating wire	Note: The common line is not GND. Do not connect the common line (black and white) to GND.	
	Yellow	channel 4		
	White	Temperature		
	Green	channel 1		
	White	Temperature		
	Orange	channel 2		
	White	Temperature	This product can only be connected to 2-wire or 4-wire vibrating wire sensors When the sensor is 3-wire, it is strictly forbidden to connect the temperature line.	
	Brown	channel 3		
	White	Temperature		
	Gray	channel 4		
simulation	Red	Sensor power +		All sensors share power
	Black	Sensor power -		
	Orange	Analog signal input 1	Sensor signal output line, voltage or current	
	Yellow	Analog signal		

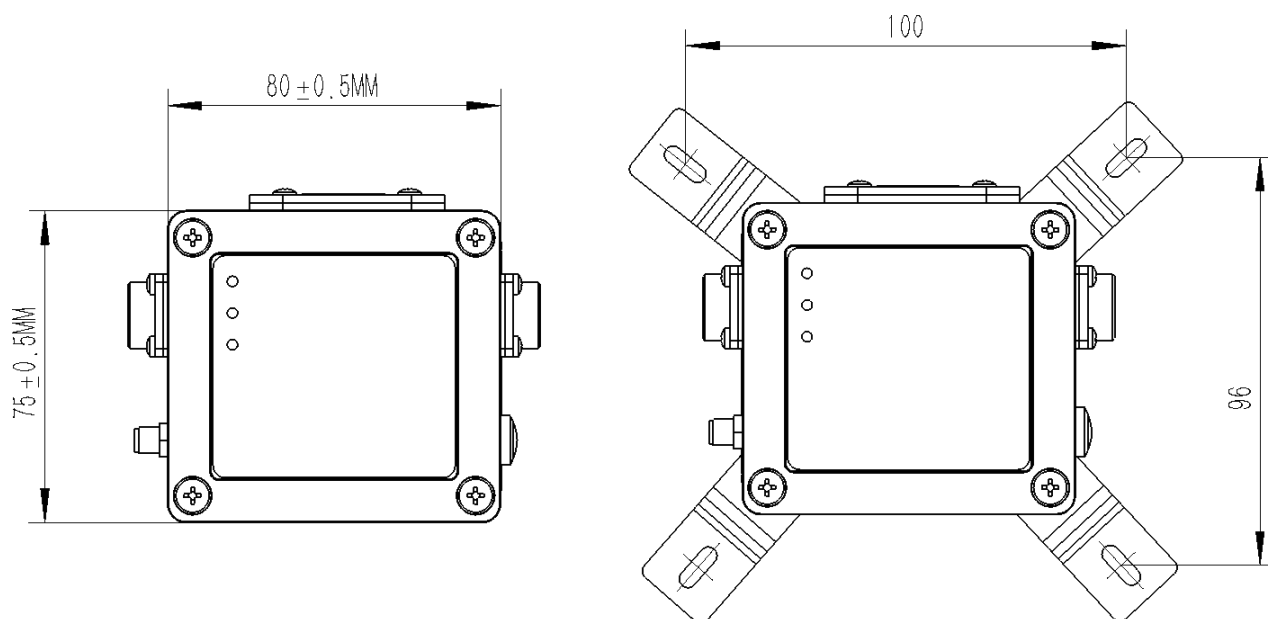
		input 2	
	Green	Analog signal input 3	
	White	Analog signal input 4	
	Blue	Analog signal input 5	
	Purple	Analog signal input 6	
	Brown	Analog signal input 7	
	Gray	Analog signal input 8	

## Mechanical Dimensions

### VS4XX



### VS10X



## Precautions

### ✓ Strict grounding

The negative of the power supply (GND) of the device should be reliably connected to the earth. Otherwise, the signal acquisition noise may be too large.

### ✓ Prevent static electricity

Static electricity can severely damage or even disable instrument components and accessories.

### ✓ Proper use of power

Use only the power cord and power adapter supplied by the product manufacturer, and use the battery according to the manual to avoid short circuit, fire, electric shock.

### ✓ Handle with care

Strong vibration should be prevented during use and transportation. Do not operate with electricity.

### ✓ No rain

This product does not have complete waterproof ability. It is strictly forbidden to contact with water in any form, and should not be used in the open air for a long time.

### ✓ Store in a dry environment

Prolonged exposure to moisture can cause corrosion of the outer casing and internal electronic components. Ensure that the exterior and interior of the device are dry before connecting the power supply.

### ✓ Note the range

Do not attempt to connect a signal line that exceeds the measurement range to the sensor interface.

### ✓ Do not operate with electricity

It is forbidden to insert and remove the physical interface (connector) of the equipment during the working period of the equipment. It is strictly forbidden to plug and unplug the SIM card and U disk.

### ✓ Timely replacement of button battery

The internal clock battery is low and the device will not work properly. It is recommended to replace it every one or two years.

## Second, start using

### 2.1 Power supply

The VS4xx can be used with the built-in battery (default) or with an external battery.

Special attention is required: It is forbidden to use the built-in and external battery (power supply) at the same time. In severe cases, it will cause short-circuit fire and permanent damage to the equipment.

The power connector has dedicated battery charging lines that can be connected to a charger or solar panel to charge the device's internal or external battery. Please use the matching charger or solar panel.

About charging current: Open the top cover of the device and switch the charging current through the toggle switch. When charging the built-in battery, it must be 0.5A. When using the external battery, according to the external battery capacity, you can use the battery charging according to the actual external use. Switch to 0.5A or 2A charging current.

### 2.2 Starting up & Turning off

#### 2.2.1 Starting up

This device has three ways to start up, namely, starting up with manual key, automatic timing starting up and signal triggering starting up.

- ✧ Starting up with manual: In the power off state, press the [ON/OFF] button, the POW indicator is on, and the button is released when the buzzer.
- ✧ Starting up with automatic: The device automatically starting up according to the preset time interval, and automatically shuts down after the completion of the work.
- ✧ Starting up with signal: Pulling the power-on signal line low (GND) is equivalent to manually pressing the button. (Please use this function after consulting).

Note: When the external power supply of the device is removed, the internal clock is still running and tries to complete the automatic startup process when the preset time arrives. If the external power supply is connected again, the device will automatically start up immediately. This is the device normal working logic, it will automatically shut down after it completes the work.

#### 2.2.2 Shutdown

The device has two working modes: Normal working and Parameter setting (see 2.5



working mode and workflow explanation). When in normal working mode, the device automatically shuts down after completing the scheduled work; when in the parameter setting mode The device never shuts down.

### 2.2.3 Version information

At starting up, a string containing the device model and version information is output via the digital interface as follows:

```
===== COPYRIGHT INFORMATION =====
type:      VS4XX
hwVer:     2.00
sfVer:     3.00
copyRight: Copyright(c)2005-2017 HB WINCOM Co. ,Ltd. All Rights Reserved
site:      http://www.winkooo.com
```

Please note that the device version information used is consistent with this manual. If necessary, please ask us for the applicable user manual.

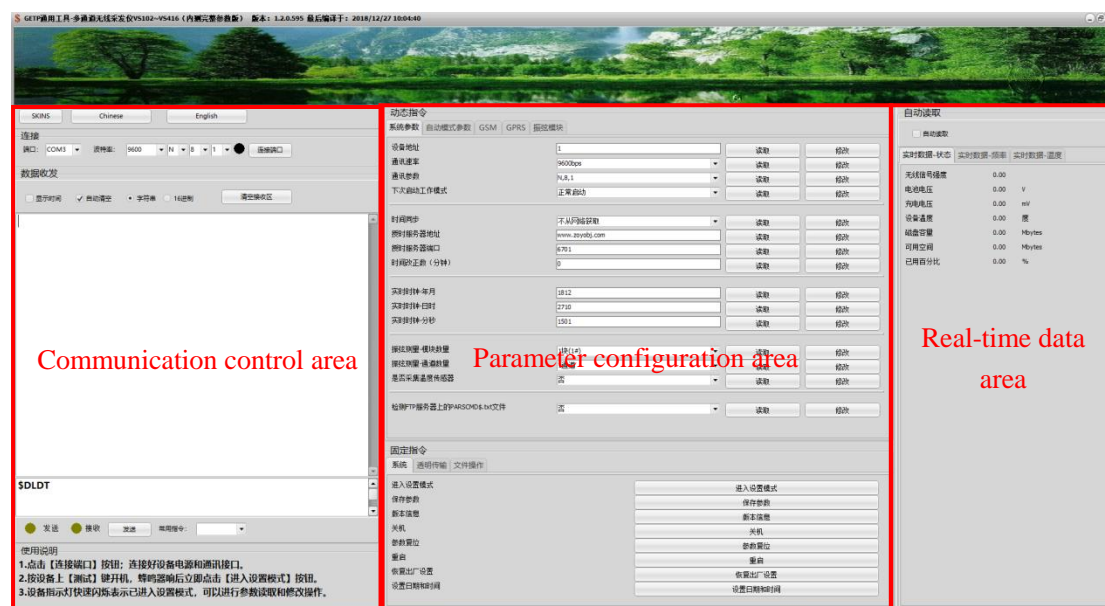
While the device is running, you can get version information by sending a string command \$INFO.

## 2.3 Parameter configuration tool SETP introduction

The parameter configuration tool SETP is a software program specially developed for the VS series multi-channel vibrating wire logger. It can read and modify all the parameters inside the device, and can also be used as a simple channel data reading tool.

### 2.3.1 Run Configuration Tool

Double-click SETP.exe to run the program as shown below.



## Parameter configuration tool SETP main interface

### 2.3.2 Interface composition

As shown in the above, the SETP tool consists of three areas: communication control, parameter configuration, and real-time data.

- ✧ Communication control area: It can complete the setting of port name and communication parameters, connect and disconnect the device, and observe the communication information with the device through the receiving frame and sending box.
- ✧ Parameter configuration area: The main operation area for parameter viewing and configuration. The operation of parameters is completed in this area.
- ✧ Real-time data area: Automatically read and display the working status and sensor data in real time inside the device.

## 2.4 Connection with the parameter configuration tool

The vs101~vs432 device is equipped with a special parameter configuration tool SETP to view and modify the working parameters of the device.

### 2.4.1 Preparation before connection

#### (1) Data interface and computer connection

Use the standard communication cable to connect to the computer RS232 interface. If you need to send data based on the mobile phone network, please install the SIM card before starting up. Connect the sensor to the sensor connector.

#### (2) Connect the device power

Use the standard power cord to connect to the power supply and ensure that the device is turned off. If the device is powered on automatically when it is connected to the power supply, you need to unplug it and reconnect it once.

#### (3) Open the configuration tool SETP

Run the SETP.exe program.

### 2.4.2 Connecting devices

In the upper left corner of the main interface, select the port name and communication parameters (default is 115200, N, 8, 1), and click the [Connect] button.

#### (4) Starting up

Press the [ON/OFF] button on the device. When the SETP receives the version information of the device, it indicates that the SETP tool is correctly connected to the device.

#### (5) Enter the setting mode

Within 3 seconds after the device outputs the version information, click the [Enter Setting Mode] button (in the [System] panel in the lower part of the [Parameter Configuration] area) to make the device enter the parameter setting working mode (the buzzer sounds once and the running indicator flashes quickly). Only in this mode can operating parameters of the device be read and modified.



### 2.4.3 Reading and modifying parameters

The parameter configuration area lists all the parameter items related to the work of the device. Each parameter item has two buttons: [Read] and [Modify]. Click the [Read] button to get the current parameter value, click [Modify] writes the value displayed on the current interface to the device.

Note: After the parameters are modified, you must click the [Save Parameters] button in the [System] panel to take effect at the next startup.

### 2.4.4 Real-time data reading

Click the [Automatic Read] check box in [Real Time Data Area], the configuration tool will automatically send a data read command to the device, and update the real-time data returned by the device to this area display.

### 2.4.5U disk parameter modification

Create an instruction configuration file PARSCMD\$.txt, add \$instructions to the file, and each instruction takes one line. Copy this file to your USB flash drive. (Each parameter can be using a corresponding \$ command, the \$ command can be obtained in the configuration tool command send box, and then filled in to the PARSCMD\$.txt file as needed)

Insert the USB flash drive into the device and pow on. The device automatically detects the PARSCMD\$.txt file in the USB flash drive and executes the \$ command.

The PARSCMD\$.txt file can be copied to the root directory of the USB flash drive or copied to the device UDID folder in the USB flash drive for all devices and devices with the specified UDID. (The folder name must be the last 6 characters of the device UDID)

For example, in the power-on information, the displayed device MCODE=1234567890123456, the UDID folder should be “123456”.

## 2.5 Work mode and Workflow

### 2.5.1 Working mode

The VS series has two working modes, normal working mode and parameter setting mode.

- ✧ Normal working mode: Also called “automatic mode”, the sensor data acquisition and transmission is automatically completed after the device starts, then shut down and wait for the next time.
- ✧ Parameter setting mode: The working mode that can access the working parameters of the device. Only in this mode can the device parameters be read and modified using the configuration tool. For enter the parameter setting mode, click the [Enter Setting Mode] button on the configuration tool interface within 3 seconds after the device is started.

Related parameters

parameter name	Parameter option/value	instruction manual
Next startup mode	Normal (default)	Normal working mode
	Send data (once)①	Force data send once, and automatically modify this parameter to normal mode
	Setting mode (once)②	Forced to enter parameter setting mode once and automatically modify this parameter to normal mode
	Send data (always)	Force data send, unless you modify this parameter, it will be used for each starting up.
	Setting mode(always)	Forced to enter the parameter setting mode, unless you modify this parameter, it will enter the setting mode every starting up.
Note①: Generally used for data transmission test after parameter modification.		

**Note②:** Generally, after the parameter modification is completed, enter the setting mode again to check whether the parameter saving takes effect.

## 2.5.2 Workflow

In the normal working mode, the device is in the sleep-off state for most of the time, and automatically powers up and detects the time parameter only at the predetermined time interval to determine whether the data storage time is reached or the data transmission time is reached. If the predetermined time point is not reached, Immediately enter the sleep shutdown state again, if the predetermined time is reached, continue sensor data acquisition, storage and data transmission.

## 2.6 Time interval setting

VS series devices support two kinds of data content sending, single data and multiple data.

- ✧ Single data transmission means that only the monitoring data of each channel currently is sent when transmitting;
- ✧ Multiple pieces of data transmission means that all stored unsent data (data collected and stored at multiple points in time) since the last transmission is sent at the time of transmission.

Single monitoring data related parameters

parameter name	Parameter option/value	instruction manual
<b>Time scan interval</b>	1~65535	Unit: Minute, specify how often to check each time interval to determine whether need to store data or send data.
<b>Data storage interval</b>	1~65535 <sup>①</sup>	Unit: Minute, specifies how often each interval to start sensor data acquisition and store the collected data once.
<b>Data transmission interval</b>	1~60000 <sup>②</sup>	Unit: Minute, specify how often to start monitoring data transmission every interval.
	65535	Enable multiple data
<b>Note①:</b> Must be an integral multiple of the time scan interval		
<b>Note②:</b> Must be an integral multiple of the data storage interval		

Multiple data package delivery

When the data transmission interval parameter value is set to 65535, multiple

data packet transmission functions are started. At this time, how to trigger multiple transmissions can be defined by the “multiple transmission scheme” parameter.

parameter name	Parameter option/value	instruction manual
<b>Multiple transmission schemes</b>	Specified number	The unsent data that has been stored is sent once in a specified number of times.
	every day	Sent once a day at a fixed time
	weekly	Sent once a week at a fixed time
	per month	Sent once a month at a fixed time

parameter name	Parameter option/value	instruction manual
Number of data	1~65535	Valid when the sending scheme is "specified number of items"
Date value	1~7 1~31	When the sending plan is valid for weekly and monthly, when it is sent weekly, this value is used to specify the day of the week, and 1~7 means Monday to Sunday. When sending for monthly, this value is used to specify the number.
Hour value	1~23	When the sending scheme is valid every day, week, or month, it is used to specify the hour value of the specific sending data.

Note: Multiple package transmissions of data can only use the "string 2.0" protocol in the data protocol, and can only set the "data transmission mode" parameter to TCP-Email or TCP-FTP.

## 2.7 Data transmission (Send)

Each time the device is started, the collected sensor data is stored internally, and the data is sent out at a set time interval. By modifying the "data transmission mode" parameter, the monitoring data can be output by the data interface or via the wireless network. When sending monitoring data, you can set the style of the sent packet by modifying the "Packet Protocol" parameter. The relevant parameters are described as follows:

parameter name	Parameter option/value	instruction manual
Data transmission method	Serial output	Output monitoring data from the physical communication interface of the device
	FSM short message	Send monitoring data to the specified mobile number via the mobile GSM network
	TCP	Send monitoring data to the specified TCP server via the mobile GPRS network <sup>①</sup>
	EMAIL	Send monitoring data to a specified email address via the mobile GPRS network
	FTP	Send monitoring data to the specified ftp server via the mobile GPRS network <sup>①</sup>
	RF radio	Send monitoring data broadcast to receiving terminal computer within several kilometers by radio frequency

	wireless
Note①: Can be set to any server address, or directly use the monitoring server of our company that has been configured at the factory to view the data directly.	

parameter name	Parameter option/value	instruction manual
Monitoring packet protocol	Hexadecimal	Generally used when sending to a TCP server, the monitoring software program on the server can identify and publish to the web page.
	String 1.0	
	String 2.0	Generally used when sending data to a mobile phone, Mailbox or FTP server, you can intuitively read the values of each sensor.

### 2.7.1 Sending data to the phone

Parameter configuration (The following parameters are located in the [Automatic Mode Parameters] and [GSM] panels in the [Parameter Configuration] area)

Data transmission method: GSM short message

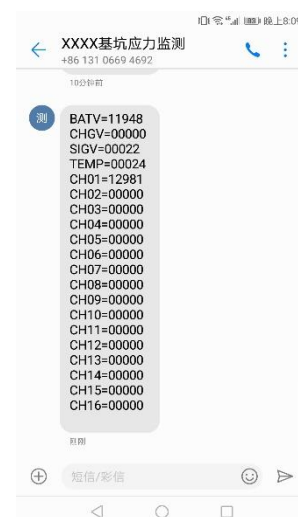
Packet Protocol: String 2.0

Data Center Phone Number 1:13012345678

数据包协议	字符串2.0
数据发送方式	GSM短消息
数据中心电话号码1	13012345678
数据中心电话号码2	

Click the [Save Parameter] button to power on the device again, and press the [ON/OFF] button of the

device to start the mining process.



When the buzzer is heard to send a tone (two consecutive short beeps), the phone receives a monitoring data.

The device automatically shuts down and starts to cycle at a set interval. The phone will receive monitoring data at regular intervals, as shown in the figure.

### 2.7.2 Sending data to the Mailbox

Parameter configuration (The following parameters are located in the [Automatic Mode Parameters] and [GPRS] panels in the [Parameter Configuration] area)

Data transmission method: TCP-Email

Packet Protocol: String 2.0

Receiver's email address: WINCOM\_TEST@163.com

数据包协议	字符串2.0
数据发送方式	GPRS邮件
接收方邮箱地址	WINCOM_TEST@163.com
邮件标题	VS400Datas



Mail title: VS4XXDatas

Click the [Save Parameter] button to power on the device again, and press the [ON/OFF] button of the device.

When the buzzer is heard to send a beep (two consecutive short beeps), the specified mailbox receives a monitoring data.

The device automatically shuts down and starts to cycle at a set interval. The mailbox will receive monitoring data at regular intervals, as shown in the figure.



### 2.7.3 Sending data to the FTP server

Parameter configuration (The following parameters are located in the [Automatic Mode Parameters] and [GPRS] panels in the [Parameter Configuration] area)

Data transmission method: GPRS-FTP 数据发送方式 GPRS FTP

Other parameters related to FTP may not be configured. Use the parameters we have configured for the device. If you need to use your own FTP server, you can modify the server address, port and other parameters.

Click the [Save Parameter] button to power on the device again, and press the [ON/OFF] button of the device.

When the buzzer is heard to send a tone (two consecutive short beeps), the ftp server receives the monitoring data.

The device automatically shuts down, starts the cycle at a set interval, and the server receives the monitoring data periodically.

Open a browser, enter the ftp server address provided with the device, pop up the user login dialog box, enter the username and password, click [Login], you can see all the monitoring data related of the device.



### 2.7.4 Sending data to the TCP server

Parameter configuration (The following parameters are located in the [Automatic Mode Parameters] and [GPRS] panels in the [Parameter Configuration] area)

Data transmission method: TCP-SEV

Packet Protocol: String 1.0

Other parameters related to TCP may not be configured. Use the parameters we have configured for the device. If you need to use your own TCP server, you can modify the server address, port and other parameters according to the actual.

We provide an online monitoring platform based on B/S architecture for each device. Users can realize real-time viewing of web pages of monitoring data without website development. This is a charging item. Please contact the sales staff to obtain the website address, user name and password.

### 2.7.5 Sending data through Lora

In the configuration tool (or send parameter instructions), modify the following 4 LoRA parameters of the device to be consistent with the recipient.

- ✓ **Spectrum Factor:** values range from 6 to 12 (default value is 8)
- ✓ **Coding Rate:** value range 1~4 (default value is 2)
- ✓ **Bandwidth:** Value range 0 to 9 (default is 7)
- ✓ **Channel Number:** values range from 0 to 15 (default is 7)

## 2.8 Remote modification parameters

The device supports remote wireless modification of device parameter functions, which can be implemented by SMS command, FTP file, and TCP online command. The parameter modification instruction needs the parameter address value. The parameter address can be obtained by the configuration tool SETP. The method is to click the [Read] button of any parameter in the tool interface. After clicking, the message will appear in the message sending box on the left side of the interface. The code of "\$GETP=aaa#", where aaa is the address value of this parameter.

### 2.8.1 Modifying parameters by SMS

The parameter modification instruction is sent to the device, and the device parses and executes the instruction in the short message when receiving the short message containing the legal instruction in the next transmission process, and the response message is sent back in the form of the short message after the parameter modification is completed. The format of the SMS command is as follows:

\$SETP=Parameter address, parameter value#  
\$SETP=Parameter address, parameter value#  
.....

The SMS command can modify multiple parameters at the same time. When editing

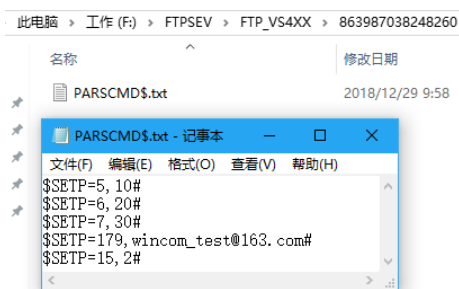


a short message, each parameter is written separately.

Note: Only the mobile phone number set to “Data Center Phone Number” is a legal order, and any short message sent by other mobile phone numbers will be ignored by the device.

### 2.8.2 Modifying Parameters by an FTP File

You can control whether to check the parameter modification file on the FTP server and execute the parameter modification command in the file after each data transmission is completed by the parameter "Detect PARSCMD\$.txt file on the server" of the device. If the value of this parameter is set to "Yes", the device will actively connect to the address specified by the FTP server parameter after sending the data, and retrieve whether there is a parameter modification file for the device on the FTP server. If there is any, the file is downloaded and executed. And delete the files on the FTP server after the execution is completed. The FTP parameter modification file contents are as follows:



```
$SETP=Parameter address, parameter value#
$SETP=Parameter address, parameter value#
.....
```

The parameter modification file can write multiple lines, and each line corresponds to a parameter to be modified.

Note: The parameter modification file should be named "PARSCMD\$.txt" and placed in the IMEI folder of the device on the FTP server. The IMEI is a 15-digit unique identification code, and each device is different. The IMEI identification code of the device can be obtained from the device startup information.

### 2.8.3 Modifying Parameters by the TCP Server

After the data is sent, the device will connect to the TCP server and keep the connection. The duration of the connection state is set by the "TCP online duration" in seconds. If the value of this parameter is set to 0, the function is not used. After the device is connected to the TCP server, the server can send arbitrary commands to the device to remotely read or modify device parameters.



When the device receives the command from the TCP server, its online duration will be delayed. That is, if the server keeps communication with the device, the device will remain online.

## 2.9 Storage Data Export

### 2.9.1 Internal Memory

During the working process of the device, the data collected periodically is stored in the internal.

- Read data from internal storage

The instruction \$GTDA=XXX Read data with ID 'XXX'.

- Internal storage data cleaning

The instruction is \$STDI=XXXXX. This instruction is used to set the ID value of the internal stored data in VSXXX. When XXX=0, it means to restart.

### 2.9.2 External Memory – U Disk

Each time the device is turned on, the device will automatically detect whether there is a U disk inserted. After the U disk is found, the data stored in the device will be automatically copied to the U disk. There are two ways to use the U disk.

(1) The U disk is always connected to the device. In this mode, each time the device starts, it automatically adds a piece of data to the U disk.

(2) The device does not insert the U disk. When needed, the U disk is inserted into the device. When the manual button is turned on, the device copies all the data stored in the device to the U disk. When the buzzer, the data synchronization is completed.

## Third, common problems

### 3.1 cannot starting up

(1) Check if the power connection is correct, the voltage range should be DC10~24V, the output capacity is not less than 2A, and the positive and negative terminals are connected correctly. If the polarity of the battery is reversed, the device will be permanently damaged even if it has not been turned on.

(3) If battery power is used, measure whether the battery voltage is too low while keeping the power button pressed.

### 3.2 Unable to communicate

(1) Check the digital interface type and connection is correct. This device has two interfaces: RS232 and RS485. The upper computer should use the correct interface to connect normally.

(2) Check if the wiring sequence is correct.

(3) The communication rate does not match, try to use different communication rates for transmission and reception testing.

### 3.3 Automatic mode failure

(1) Try to turn it on manually and check if the date and time are correct. If the date and time are not correct, replace the internal button battery.

(2) Check if the time register value related to the automatic mode is set correctly, pay attention to the data unit.

### 3.4 vibrating wire sensor frequency value is 0

(1) If the sensor is not connected or the contact is poor, or the sensor line is open or shorted, please measure whether the sensor resistance is normal after disconnecting the sensor (the coil resistance of most vibrating wire sensors is between 100~2k $\Omega$ ).

(2) The incentive method is incorrect. Some sensors must use specific excitation methods to start the vibration. If necessary, please contact our technicians.

### 3.5 vibrating wire sensor frequency value is unstable

(1) Shorten the cable length of the sensor and equipment, or switch to a cable with good shielding properties with low resistivity.

(2) The equipment casing or the power supply negative terminal must be reliably connected to the earth (ground).

(3) Replace the linear power supply or use the battery to supply and disconnect any AC-related lines.

(4) Disconnect all connections except the vibrating wire sensor (other types of sensors, power output load, etc.) and connect only a single sensor if necessary to eliminate crosstalk between different sensors.

(5) Check for strong electromagnetic interference and large-scale AC equipment (such as power distribution frames, motors, large engineering equipment, radios, etc.) around the measurement system (the equipment, cables, and sensors).

(6) Some sensors return signals that are very weak and are highly susceptible to the excitation signals of other channels, which will cause the data of this channel to be close to other channels. It is recommended to replace the sensor manufacturer or consult us for the recommended sensor model.

### 3.6 Cannot send wireless data using mobile phone network

(1) Check if the SIM card is in arrears.

(2) Whether the signal of the device is normal.

(1) If you use short message to send, please confirm whether supports SMS function and open SMS service.

(2) If sending with GPRS, use a third-party tool to verify that the server address and port are accessible.

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