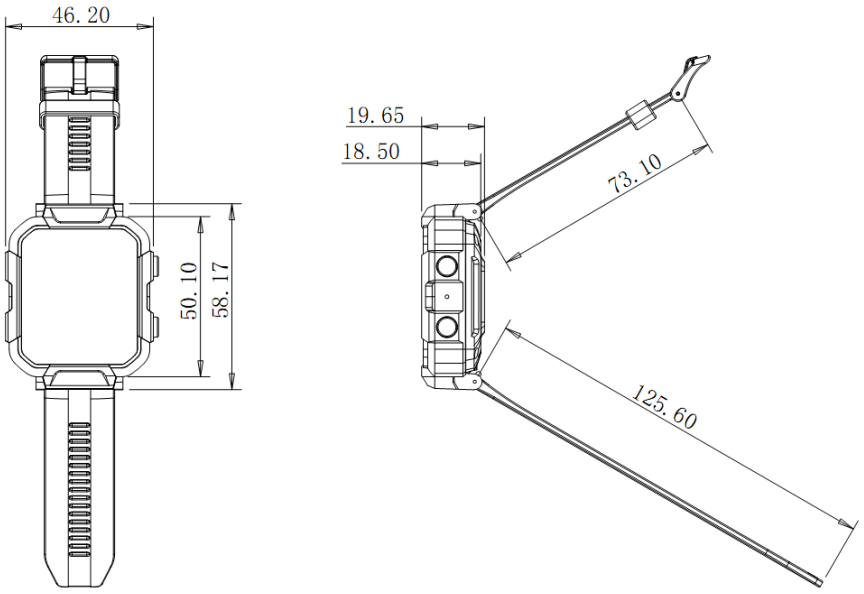
Smart GPS watch
Datasheet

Catalog

Notice: The specific functions and performance of the watch vary according to the firmware and server software. This document is for reference only. Actual functions and working logic shall be subject to actual performance.

1. Specification

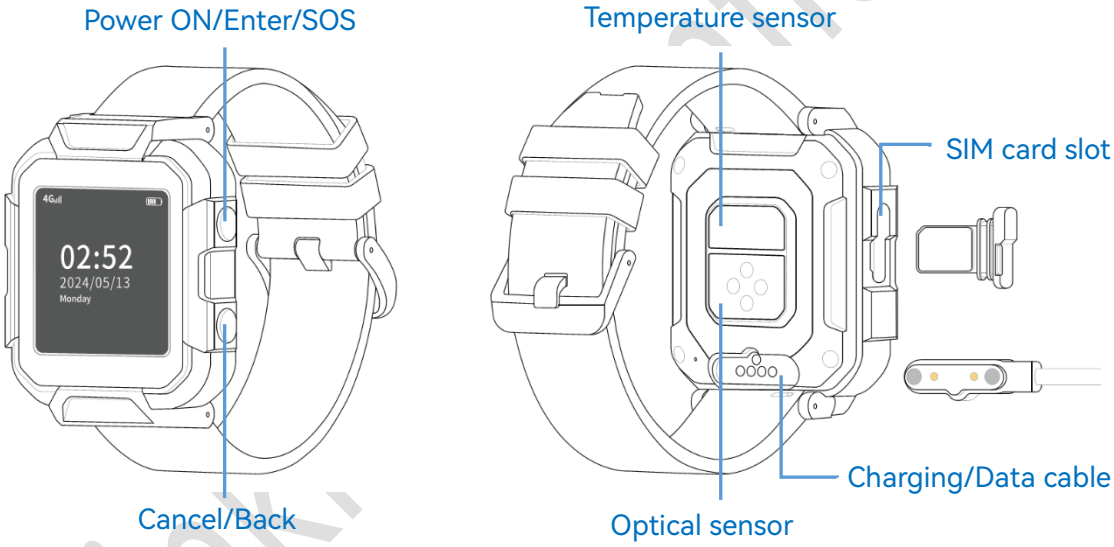
Main Chip	SL8541	OS	Android 8.1 Support open SDK
Memory	DDR 1GB+Flash Memory 8GB	Camera	No (Support customize)
Frequency Band	2G:B2/B3/B5/B8 3G:B1/B2/B4/B5/B8 FDD:B1/B2/B3/B4/B5/B7/B8 /B20/B28A/B28B/B66 TDD:B38/B39/B40/B41	Screen	1.78 inch 368*448 amoled screen oncell glass,SH8601 IC,CST9217 IC
		Health Sensor	VC9202A - Heart rate+ blood pressure + blood oxygen GX112XA -Temperature
Satellite Positioning	GPS/QZSS BDS GLONASS Galileo BDS-3 B1C (Optional)	Geomagnetic sensor	VTC AF6133E (Optional)
		Gravity sensor	SC7A22H
GPS receive sensitivity	Tracking sensitivity:-165dBm	Pressure sensor	SPA06-003 ±1hPa
	Acquisition sensitivity:-147dBm	Watch Battery	950mAh with BMS (NTC) 4.45v
Tracking mode	GPS+ AGPS+ LBS+ Wi-Fi+ BLE Beacon+ SDK (Optional)	Working temperature	—20～60℃
		Working humidity	5% to 95% non-congealable
Wi-Fi data	Support	Waterproof	IP68 (See the Chapter 2.15)
BLE	Support	Weight	61g
Speaker+ Mic	Yes	Size	See the diagram
Vibrate	Yes /0820	Strap	Silicone/Braid/Stainless steel



The watch has three kinds of replaceable watchbands. Different watchbands are used to form a tamperproof watch and an ordinary detachable watch.

2. User Manual

Please read the user manual carefully before use for proper installation and quick use.
The product color, interface layout, and functionality are subject to the actual product.



2.1 Preparation before use

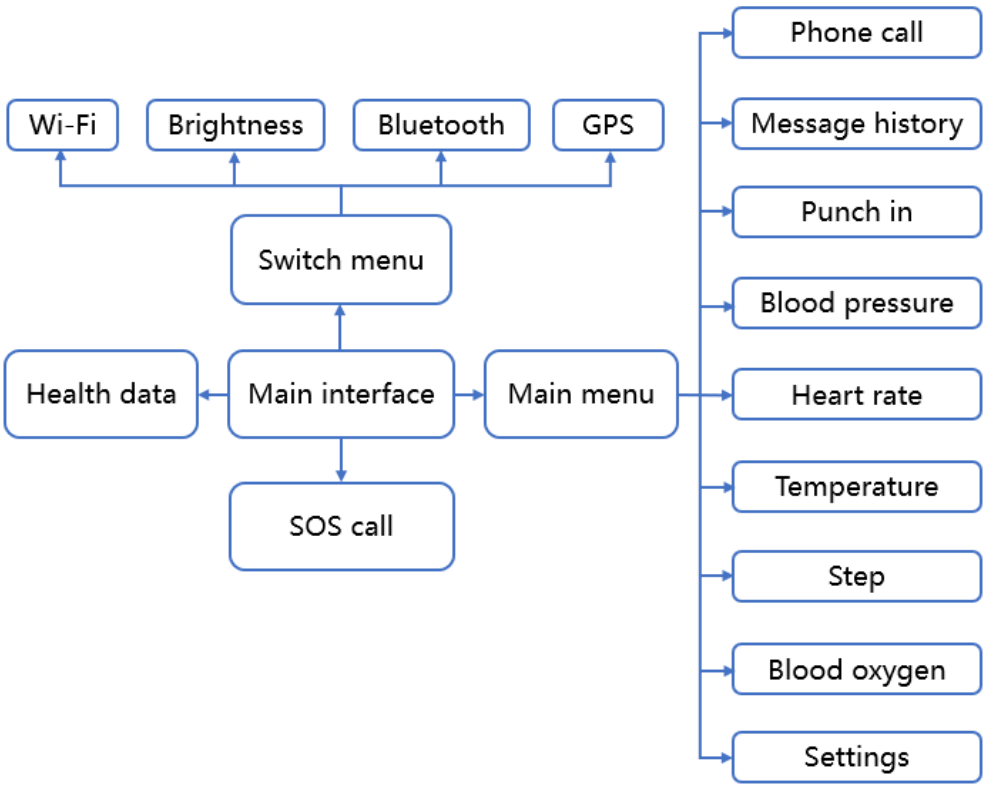
1. Check whether the watch model is correct and whether the accessories are complete.
2. Prepare a Nano SIM card that supports the 4G network. This card should not be bound to any other IMEI or mobile communication device, and it should not be a dedicated card or a contract card. For specific details, please refer to the advice of the SIM card supplier.
3. The SIM card needs to have the PIN code removed and should have SMS, call, GPRS, and caller ID functions activated.
4. Please turn OFF the watch before inserting the SIM card. If you insert the SIM card while the watch is ON, please restart the watch after inserting the card.

5. Please use the original 2 pin charging cable and the original power adapter to charge the watch. Do not use a fast-charging power adapter, as it may damage the battery. If you purchase a power adapter on your own, it should support a nominal voltage of 5VDC/1A and have obtained mandatory safety certification. If the power adapter you provide does not meet the mandatory safety certification requirements or exceeds the nominal parameters, there may be safety risks such as fire, electric leakage, and explosion. Any damage to the watch caused by this will not be covered by the warranty.
6. Install the APP on the mobile phone or access the backend server. For details, please consult your dealer.

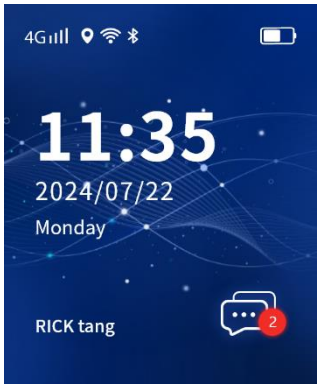
2.2 Power ON/OFF and restart

1. Power ON
   Long press the upper button (power on/confirm/SOS) to turn it on.
2. Power OFF
   Method 1: Swipe left to enter the main menu, select 'Settings', choose the shutdown option, and confirm shutdown;
   Method 2: Remote shutdown can be achieved by issuing instructions through the backend server.
3. Restart
   Method 1: If a SIM card is already inserted, swipe left to enter the main menu, select 'Settings', choose the restart option, and confirm the restart;
   Method 2: If the SIM card has not been inserted yet, long press the upper button (power on/confirm/SOS) to restart the watch;
   Method 3: Remote restart can be achieved by issuing instructions through the backend server.

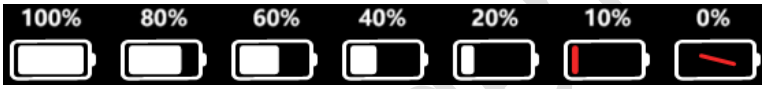
2.3 Menu



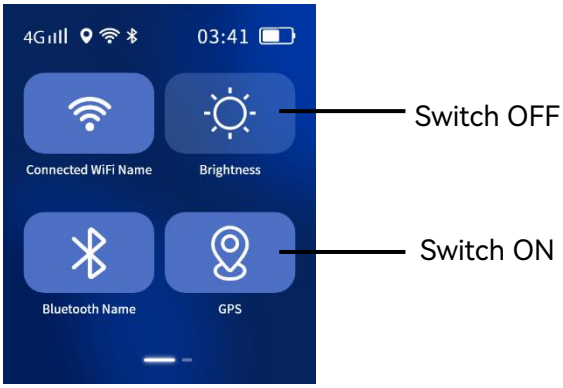
2.4 Main interface



The icon indicates the status of the watch and its connection to the backend server. Please refer to the following table for specific instructions:

Remaining battery icon	
Charging power icon	
Network and signal level icon	
Backend server connection status icon	 No connection  Connecting
Number of unread new messages	
Network connection status icon	 Getting GPS location  Wi-Fi connecting  BLE opened

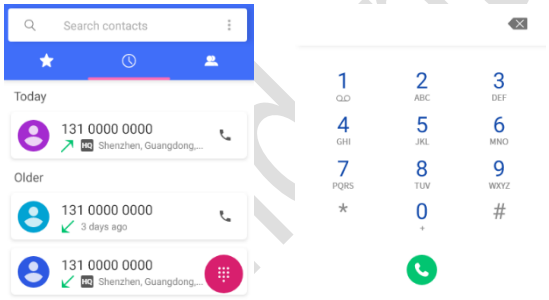
2.5 Switch menu

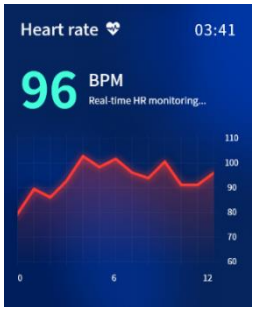
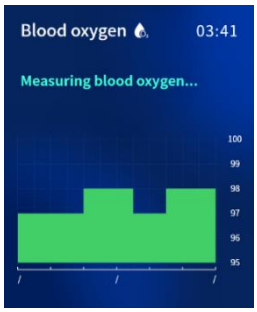
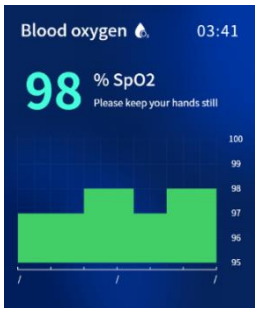
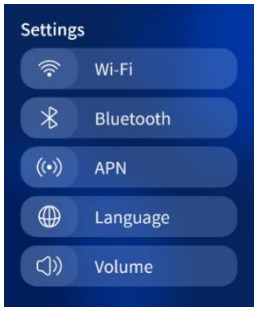


Swipe down the screen to enter the switch menu, which includes four switches: Wi-Fi, screen display brightness, Bluetooth, and GPS. The light blue background of the switch indicates on, and the dark blue background indicates off. Click the icon to turn on/off the switch, long press the switch to enter the specific configuration menu.

2.6 Main menu

Swipe left to enter the main menu, which includes the following functions:

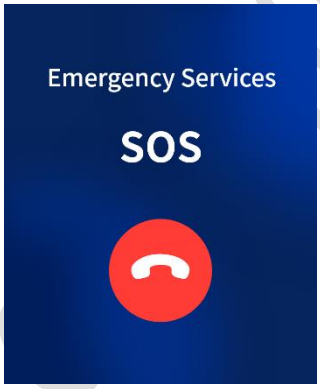
Phone function The function includes a dial pad, incoming calls, and call records, allowing the wearer to make and receive calls.	
Message history function The watch shows message list includes multimedia messages such as SMS , voice messages, image, and text messages. Choose one to view its complete information and play multimedia messages.	
Check in function The watch displays IMEI and QR code for scanning. The barcode scanner scans the QR code to check-in the watch.	
Blood pressure function The watch detects the wearer's blood pressure, and uploads to the backend server; The watch will automatically detects and uploads data at set intervals.	 

Heart rate function The watch detects the wearer's heart rate, and uploads to the backend server; The watch will automatically detects and uploads data at set intervals.	 
Temperature monitoring function The watch detects the temperature of the wearer's wrist and uploads to the backend server. The watch will automatically detects and uploads data at set intervals.	 
Pedometer function The watch detects and records the wearer's steps and uploads them to the backend server.	
Blood oxygen The watch estimates the blood oxygen value based on detected health data and uploaded to the backend server.	 
Settings Set up more watch settings functions.	

2.7 Health data

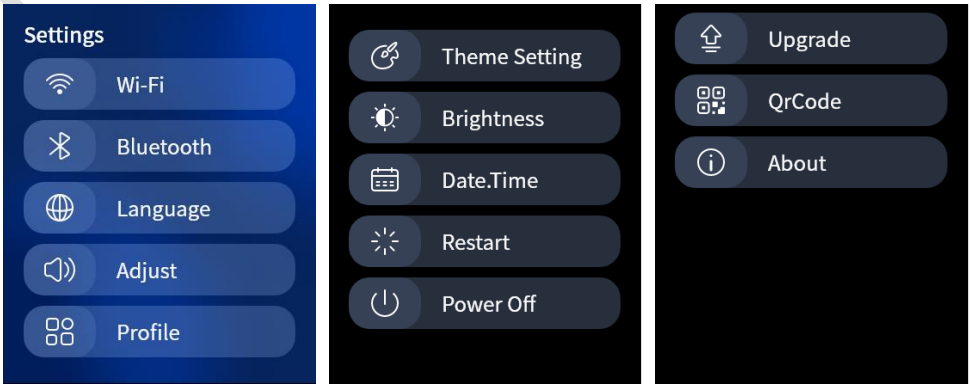
Swipe right the screen to enter the health data display function, which displays the last health data. Please check more health data in the backend server.

2.8 SOS call



Quickly press the upper button (power on/confirm/SOS) for three times, the watch will dial the preset SOS number and upload SOS alarm data to the backend server.
If the SOS number has not been set, the watch will display "No SOS number,Setup now". If there are more than one SOS numbers, the watch will dial all SOS numbers in sequence until the call is answered or the wearer presses the back/cancel button to cancel the SOS call.

2.9 Settings



The settings menu includes the following functions:

Wi-Fi	Set Wi-Fi connection parameters
Bluetooth	Set BLE parameters, search for devices and pair them
Language	Set interface language and time zone
Adjust	Adjust watch volume
Profile	Adjust the ringing/vibration mode
Theme setting	Display theme settings
Brightness	Brightness adjustment
Date/Time	Set date/time
Restart	Restart and restore factory settings
Power OFF	Power OFF the watch
Upgrade	Remote firmware upgrade
Qr Code	Display watch IMEI number and corresponding QR code
About	Display watch model, firmware version, and IMEI number

2.10 Connection and network

The watch supports wired and wireless data connections.

2.10.1 GPRS

The watch can connect to the network through GPRS of the SIM card, and send data to the server through TCP protocol. It works with 2G/3G/4G network. If the feedback packet sent by the server is not received within the scheduled time, the watch will try to re-read the SIM card or try to restart to regain the network connection.

2.10.2 Wi-Fi

The watch supports network communication via Wi-Fi connection. You can set Wi-Fi connection parameters through SMS or GPRS commands. For specific command format, please refer to Chapter 3, Protocol and Command. In the default firmware version, when the network connection is disconnected, the watch will only try to reconnect through 4G, not through Wi-Fi. However, the customized firmware can try to reconnect through Wi-Fi.

2.10.3 BLE

The watch supports network communication through BLE.

1. The watch can be paired with a mobile phone for communication.
2. The watch can search for surrounding Bluetooth MAC addresses and upload them to the server. The default firmware version only turns on the Bluetooth module within 30 minutes after booting up. But it can be set to keep Bluetooth on through SMS or GPRS commands.
3. The watch support customize firmware to broadcast its own MAC address for other devices to discover it.

2.10.4 Cable

The watch supports communication with computers or testing equipment through data cable. You can send AT commands or flash firmware through a data cable. Pressing two keys simultaneously can force the flashing of the watch.

2.11 Engineering mode

Quickly press the top button for 8 times on any interface to enter engineering mode.

2.12 Tracking

The watch supports GPS , AGPS ,Wi-Fi ,LBS and Beacon for indoor and outdoor tracking. The default tracking priority is GPS>Wi-Fi>LBS.

The tracking process is to search GPS for maximum 90 seconds to get and report GPS location. The watch would send Wi-Fi , LBS location data with the GPS tracking data.

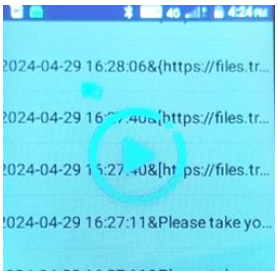
The watch supports real-time tracking. By issuing commands, the watch can immediately try to obtain and upload tracking data. For specific command format, please refer to Chapter 3, Protocol and Command.

As an optional solution, we support integrate third-party network positioning SDK in watch, and return coordinate directly indoors and in places with poor GPS signals. The accuracy is better than using Wi-Fi or LBS only .

The watch also supports other positioning modes, such as only using Wifi for positioning. See the IW protocol for the specific setting method.

2.13 AI nortification

The watch supports receiving and automatically playing the multimedia notification data sent by the server. Multimedia notifications include picture, text and audio messages. When the administrator inputs words in a certain language on the server side, the AI module (artificial intelligence) integrated in the server converts them into voice messages in the corresponding language and issues them to the watch. The watch will automatically play the received voice message without any operation by the wearer.

Photo message	Text message	Voice message
		

2.14 Distance alert

The system manager configures the Offender(Target) and their Victims(Guardian).The system would release alert to both sides when some offenders close to a victim. The offender and victim's watches show distance alert. The system would show distance alert and location of both offender's and victim's watch.

2.15 Waterproof

The watch is splash,water and dust resistant and were tested under controlled laboratory conditions with a rating of IP68 under IEC standard 60529.It survived 30 minutes submerged in 1.5m clean water.

Splash, water and dust resistance are not permanent conditions and resistance might decrease as a result of normal wear.Liguid damage not covered under warranty.

Please avoid these to prevent liquid damage:

1.charging a wet watch.

2.Swimming or bathing in warm water with the watch.

3.Exposing the watch to pressurized water or high velocity water,such as when showering, water skiing, wake boarding,surfing, jet skiing, and so on.

4.Using the watch in a sauna or steam room.

5.Intentionally submerging the watch in water

6.Operating the watch outside the suggested temperature ranges orin extremely humid conditions.

7.Dropping the watch or subjecting it to other impacts.

8.Disassembling the watch, including removing screws or force open the back cover.

9.Users should also minimise the watch exposure to soap, detergent acids or acidic food and any liguids like perfume,insect repellent,lotions, sunscreen,oil, adhesive remover, hair dye and solvents.

2.16 Safety, operation and support

Warning

When using the watch, please comply with the laws and regulations in your area. Not following these safety instructions may result in fire, electric shock, injury, or damage to equipment or other property. Before using the watch, please read all the security information below.

Operation

The watch contains highly sensitive electronic components, which can be damaged by dropping, burning, puncturing, or crushing. Do not use damaged watches, such as cracked screens, obvious water ingress, or damaged watch straps, as they may cause injury. Avoid prolonged exposure to sand and dust.

Phone call

The calling function requires a SIM card that supports calling. Do not use the call function while performing other activities that require full attention.

Repair

Do not open the watch and attempt to repair it yourself. Dismantling the equipment may cause damage, render it no longer waterproof, and may result in injury to you. If the watch is damaged or malfunctioning, please contact the dealer or their authorized service provider.

Battery

Do not attempt to replace the built-in battery of the watch by yourself. You may damage the battery, causing overheating and personal injury. The maintenance service of lithium-ion batteries in the equipment should only be provided by dealers or their authorized service providers. Batteries must be recycled or disposed of separately and cannot be mixed with household waste. Do not burn the battery.

Distraction

In certain situations, using watches can distract your attention and may pose a danger. Please comply with the relevant regulations prohibiting or restricting the use of mobile phones (such as avoiding texting while driving and using dialing functions).

Tracking

This application relies on data services. These data service signals are subject to change at any time and may not be available in all areas, so the positioning information provided in some locations with poor signals may be unavailable, inaccurate, or untimely.

3. Protocol and command

SMS commands refer to a series of specific commands that a watch can execute by receiving SMS without connecting the server. These commands are released from the watch manager by sending SMS (Short Message Service) to the watch SIM card through their mobile phone. The SIM card of the watch should support SMS and have enough balance, and the watch firmware will decode and execute commands.

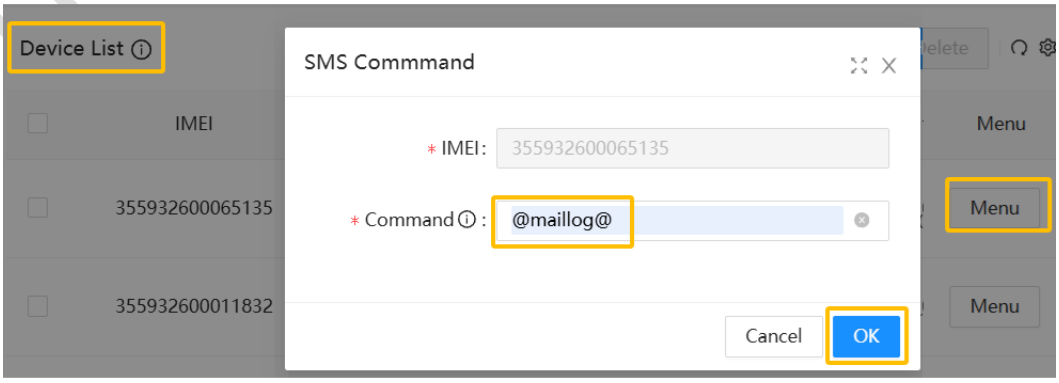
The SMS command format is "password#Command ID#" or "password#Command ID=parameter#". The firmware of the watch will check the password. For SMS messages with the correct password, the watch will execute the command and reply with the execution result via SMS.

For SMS with incorrect password, the watch will not execute any instructions. Some watches will play short ringtones to remind users of password errors, while others will display incorrect instructions on the information interface.

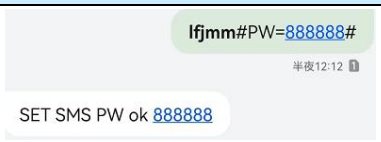
For SMS messages with incorrect command formats, watches with screens will display the command on the information interface.

GPRS command refer to a series of specific commands that a server sends to a watch through wireless communication networks such as GPRS/4G/Wi-F. The GPRS commands content format is "@Command ID@" or "@Command ID=parameter@". The comma ',' in the parameter should be replaced by a dash '-'. The parameter should not include '@' or '#'.The GPRS command does not verify passwords. Pls check 'IW protocol-24.GPRS command (Downlink ID:BPSM, Response ID:APSM)' for the format of whole command.

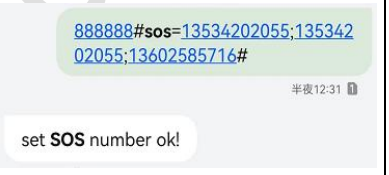
For more commands and data package formats, see IW protocol document.



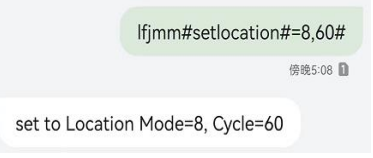
3.1 Password management

Command format	Description	Example
SMS command format Password#PW=Newpassword# GPRS command format @PW=Newpassword@	The command ID is PW; The password should be six letters or numbers; The initial password is lfjmm; The watch is supposed to reply with 'SET SMS PW ok +New password'.	 GPRS command: @PW=123456@ The GPRS reply is: IWAPSM,680835,SET SMS PW ok 123456#

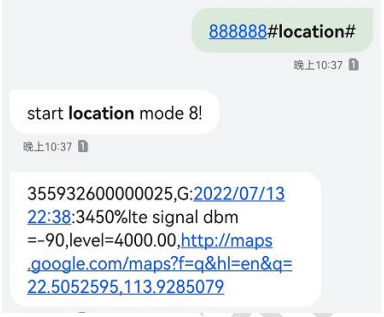
3.2 SOS number management

Command format	Description	Example
SMS command format Password#sos=SOSnumber1; SOSnumber2;SOSnumber3# GPRS command format @sos=SOSnumber1; SOSnumber2;SOSnumber3@	The command ID is SOS; Setting SOS number. The watch is supposed to reply with 'Set SOS number ok! '; The watch would dial all SOS phone numbers in turn, and upload GPRS SOS alert with latest location by pressing the SOS button; The dialing will be repeated for three times until a call is connected or the SOS button is pressed again to cancel the SOS process.	 GPRS command: @sos=64812855;+8526481 2855;85264812855@ The GPRS reply is similar to that of SMS reply: IWAPSM,680835,set SOS number ok!#

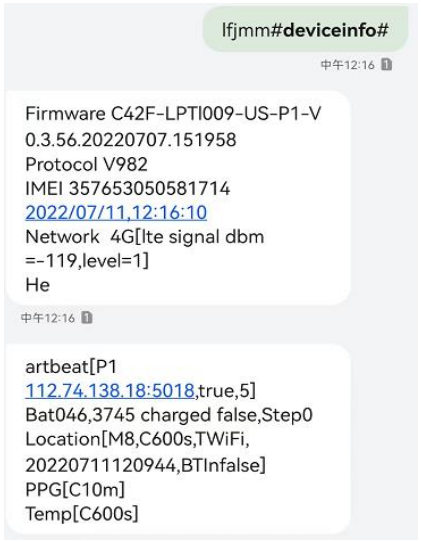
3.3 Working mode and GPS interval management

Command format	Description	Example
SMS command format Password#setlocation# =Mode,Parameter# GPRS command format @setlocation@ =Mode,Parameter@	The command ID is SETLOCATION; Configure the working mode and GPS upload interval; Mode=8 means GPS location takes precedence over WiFi location; The watch would try to search GPS signal for 90 seconds then upload GPS location for success, or upload the last WiFi location for failed; The parameter for define the upload interval of GPS location. The unit is second; The watch is supposed to reply with 'Set to Location Mode=value, Cycle=value'.	 GPRS command: @setlocation@=8-5@

3.4 Check location

Command format	Description	Example
SMS command format Password#location# No GPRS command	The watch is supposed to reply with 'Start location mode value!+IMEI+ location time +battery level+ GPRS signal+network level+Google map link'; Mode=8 means GPS location takes precedence over WiFi location.The watch would try to search GPS signal for 90 seconds then upload GPS location for success. If the watch inside the building, it will return the last GPS location storage in CACHE, it may not be accurate.	

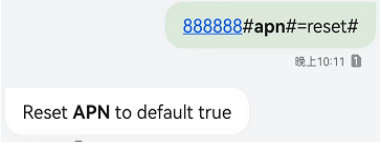
3.5 Reviewing the watch status

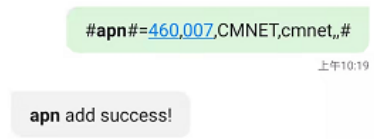
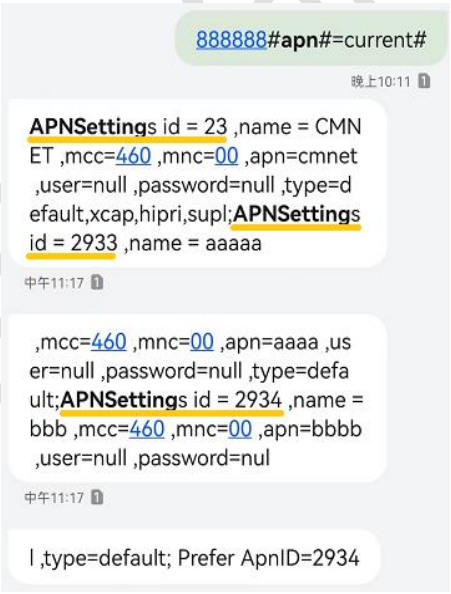
Command format	Description	Example
SMS command format Password#deviceinfo# No GPRS command	The command ID is DEVICEINFO; The watch is supposed to reply with watch's information, such as working mode, time interval of GPS tracking, the last time of location, etc.	

Contents of reply SMS	Description
Firmware C42F-LPTI009-US-P1-V0.3.56.20220707.151958	The version of watch firmware.
Protocol V982	The version of communication protocol implemented to the watch
IMEI 357653050581714	IMEI No. assigned to the watch.
2022/07/11,12:16:10	The time of reply the command.
Network 4G[lte signal dbm =-119,level=1]	The current network is 4G, the signal level of 4G is 1 (The best signal is 5).

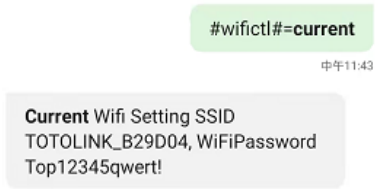
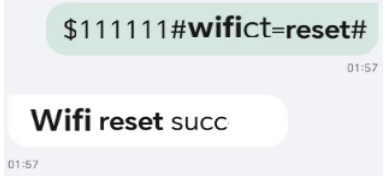
Heartbeat [P1112.74.138.18:5018,true,5]	The server IP for uploading the heartbeat values; The value "true" means connected to the tracking server successfully; The value "5" means heartbeat uploading interval is 5 minutes.
Bat046,3745 charged false, Step0	Battery level and pedometer value; The value "046" means the battery level is 46%; The value "3745" means the voltage value is 3.745v; The value "0" means the pedometer is 0 steps.
Location [M8,C600s,TWiFi, 20220711120944,BTInfalse]	The value "M8" means the watch is working in tracking mode 8. The value "C600s" means location data uploading interval is 600 seconds; TWiFi means the tracking way of last location is WiFi; The value"20220711120944"is location time of the last location.It is 2022-07-11 12:09:44; BTInfalse is undefined for 4G watch.
PPG[C10m] or PPG[C5,P64,H108,L70,T31.00, TA35.55,20200225230645]	Heart rate detection interval; C0m means the watch don't support heart rate detection; The value "C10" means the heart reat uploading interval is 5 mins; The value "P64" means the value of heart rate is 64; The value "H108" means the high pressure of blood pressure is 108; The value "L70" means the low pressure of blood pressure is 70; The value "T31.00" means the wrist temperature is 31.00 degrees Celsius; The value "TA35.55" means the body temperature is 35.55 degrees Celsius; The value " 20200225230645" means the heart rate and temperature data detection time is 2020-02-25 23:06:45.
Temp[C0s] or Temp[C600s]	Temperature detection interval; The value "C0s" means the watch don't support body temperature detection; The value "C600s" means the temperature data uploading interval is 600 seconds;

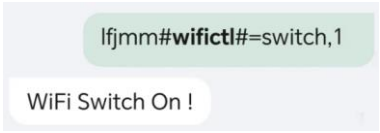
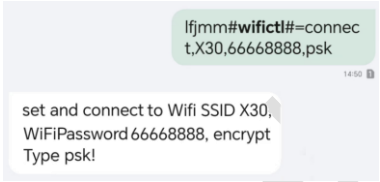
3.6 Setting up APN

Command format	Description	Example
SMS command format Password#apn#=reset# GPRS command format @apn@=reset@	The command ID is APN; Reset the APN configuration to default value; The watch is supposed to reply with 'Reset APN to default true/false'.	

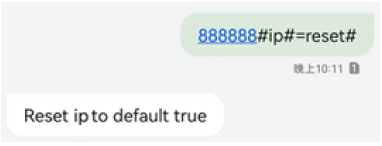
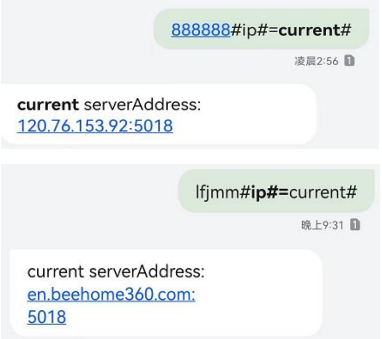
SMS command format Password#apn#=MCC,MNC,ApnName,apn,user,password# GPRS command format @apn@=MCC,MNC,ApnName,apn,user,password@	The command ID is APN; Configure and enable a new APN parameter,or enable an existing APN parameter which is already in the firmware; The watch is supposed to reply with 'apn add success!'; Repeatedly setting the same APN parameters may cause the watch to reply with ERROR reminder SMS.	 GPRS command: @apn@=234,50,TM,TM,,@
SMS command format Password#apn#=current# No GPRS command	The command ID is APN; Check the existing APN saved in watch firmware; The watch is supposed to reply with the APN which are matching the current MCCMNC. It won't list all APN parameters; Every APN parameter start with APN Settings ID such as 'APNSettings id=23'.	

3.7 Wi-Fi management

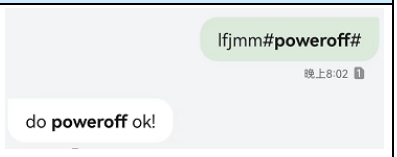
Command format	Description	Example
SMS command format Password#wifictl#=current No GPRS command	The command ID is WIFICTL; Check the current Wi-Fi configuration; The watch is supposed to reply with Current Wifi Setting SSID,WifiPassword	
SMS command format Password#wifictl#=reset GPRS command format @wifictl@=reset	The command ID is WIFICTL; Reset the Wi-Fi configuration to default value; The watch is supposed to reply with 'Reset Wifi reset successfully /failed'.	

SMS command format Password#wifictl#=switch,Value GPRS command format @wifict@=switch,Value	Wi-Fi module switch.Set the Value as 1 to open Wi-Fi module and set 0 to close it. The watch is supposed to reply with 'Wifi Switch On/OFF'.	
SMS command format Password#wifictl#=connect,SSID,Password,EncryptType GPRS command format @wifictl@=connect,SSID,Password,EncryptType	Configure the Wi-Fi connection; The EncryptType value can be the following: psk,wep,aes,etc. You need send this command to switch ON the Wi-Fi module first, otherwise the set Wi-Fi may not be effective: Password#wifictl#=switch,1	 GPRS command: @wifictl@=connect-X30-66668888-psk

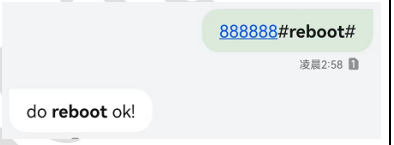
3.8 Setting up server IP

Command format	Description	Example
SMS command format Password#ip#=reset# GPRS command format @ip@=reset@	The command ID is IP; Reset the server IP as factory settings; The watch is supposed to reply with Reset ip to default true/false	
SMS command format Password#ip#=IP:PORT# GPRS command format @ip@=IP:PORT@	The command ID is IP; Set up server IP and port, support domain name; The watch is supposed to reply with 'Password#ip#= IP:PORT#success/fault!'	 GPRS command: @ip@=121.37.252.13:4500@ or @ip@=node.5gcity.com:4500@
SMS command format Password#ip#=current# No GPRS command	The command ID is IP; Check the existing server IP saved in watch firmware; The watch is supposed to reply with Current server Address: IP:PORT.	

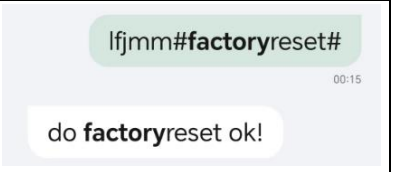
3.9 Power OFF

Command format	Description	Example
SMS command format Password#poweroff# GPRS command format @poweroff@	The command ID is POWEROFF; Power OFF the watch remotely; The watch is supposed to reply with 'do poweroff ok!' then execute the command.	

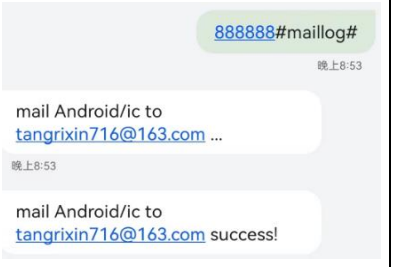
3.10 Reboot

Command format	Description	Example
SMS command format Password#reboot# GPRS command format @reboot@	The command ID is REBOOT; Restart the watch remotely; The watch is supposed to reply with 'do reboot OK!' then execute the command.	

3.11 Back to the factory

Command format	Description	Example
SMS command format Password#factoryreset# GPRS command format @factoryreset@	The command ID is FACTORYRESET; Restore the watch to factory settings remotely; The watch is supposed to reply with 'do factoryreset OK!' then execute the command.	 GPRS command: @factoryreset@

3.12 Mail the watch log

Command format	Description	Example
SMS command format Password#maillog# GPRS command format @maillog@	The command ID is MAILLOG; Send the log of Watch by mail; The Watch is supposed to reply with 'mail Android/ic to mailbox…' then execute the command; The Watch would reply with 'mail to mailbox success!' after all the log be sent.	 GPRS command: @maillog@