MS140 User Manual

Electronic Monitoring Device

Contents

1. Product Overview

Thanks for purchasing our product.

This is an electronic monitoring ankle with IP68 waterproof, anti-tamper, long standby time and other functions, suitable for prisoner monitoring.

Its location can be obtained through a GPS (Global Positioning System) locator, and thro ugh

Google Earth or Google Maps sends location data to your smartphone; At the same time, it will send the location information through GPRS, it is sent to the Internet server platfo rm, so you can see the location of the tracker in real time.

Ankle function introduction：

Timing tracking / Real time tracking	Siren sound alarm
Support UDP or TCP transmission	SOS emergency alarm
GPS+LBS +WIFI positioning	IP68 Waterproof level
Support Bluetooth and RF signal connection	Low battery alarm/ Geo-fence alarm
5 Kinds of different length size	Wireless charger
Two-way conversation/ Voice monitoring	Dual SIM Card
Physical Lock and Electronic Lock	GPRS data logger
Belt cut/off/cut alarm	SIM card cover open alarm
A maximum of 3 authorized mobile phone numbers are supported	Remotely upgrade

2. Safety instruction

Please read the following terms carefully, improper use will damage the ankle, lead to dangerous delivery and even break the law.

Safe startup	Do not turn on devices in places where the use of wireless phones is prohibited or where interference and danger may occur
Shutdown of medical facility	Follow the regulations of the medical facility and turn off medical equipment when approaching it
Airplane shutdown	Follow airport regulations and turn off devices while on board
Turn off when refueling	Do not use this device at gas stations
Blasting site shutdown	In accordance with the special site regulations, the equipment should be closed when working in the blasting site
Machine	Non-professionals are not allowed to disassemble the device and its maintenance related components without authorization
Waterproof	The waterproof grade of this product is IP68

3. Specifications parameters

Project	Specification
4G module	SIM7670SA
Frequency Bands	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B28/B66 GSM: 850/900/1800/1900Mhz
GPS chip	AT6558R-5N chip
Positional accuracy	<15 M, 2D RMS>
Speed accuracy	0.1 M/S
Turnover time	Average 0.1 seconds
Warm boot	Average 20 seconds
Cold boot	Average 70 seconds
Maximum altitude	18,000 meter (maximum 60,000 feet)
Maximum speed	500 m/s (maximum 1000 knots)
Maximum acceleration	Less than 4g
Charging voltage	DC5V
Power bank battery	6000mAH
Main engine battery	2000mAH 3.8V
Dedicated charging cable for device charging time	About 2h

4.Getting started use

4.1 Parts Lost

MS140 host device	1
Mobile Charging Bank（6000mAH）	1
Bluetooth Beacon	1
Device Magnetic charging cable	1
Power Bank charging cable	1
British standard adaptor charger （5V 2A ）	1
Key	2
Phillips screwdriver with plum head	1
self-tapping screw	4
Paper manual	1
Silicone case	Optional

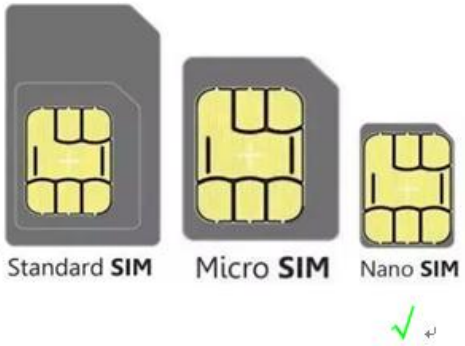
4.2 Function key and port

Red /**green** – Power indication	
The red light is always on	Power charging
The green light is always on	Power charging finished
Blue - GSM indication	
0.3s on and 0.3s off	GSM module is initializing or calling in
Always on	GSM network is not registered
1s on and 3s off	GSM network is registered
0.1s on and 3s off	GSM network is registered and connected to the server by GPRS
Always off	GSM in power save mode
Green - GPS indication	
0.3s on and 0.3s off	GPS module is initializing or waiting for the SOS button press to confirm the calling in number as the authorized number
Always on	Button being pressed
1s on and 3s off	GPS module is working normally but hasn't fixed position
0.1s on and 3s off	GPS module is working normally and has fixed position
Always off	GPS module stops working

Switch	
Power switch	Press 1s to check battery level; Long press 5s for turn on/off tracker
Button	
SOS Button	Press SOS button for 3 seconds so tracker will send an emergency SMS to the authorized number and dial it

4.3 Install SIM card

The device supports only Nano SIM cards



Explanation:

The device supports only Nano SIM cards

Ensure that the lock password for the SIM card is disabled

Confirm that the SIM has sufficient balance (use the mobile phone to test whether it can receive calls and send short messages normally)

If real-time location query is required, ensure that the SIM card supports caller ID

Note: The device must be turned off before removing the card when removing or replacing the card.

After installing the SIM card, you need to set the APN, APN user name, and APN password. These parameters need to be set when using GPRS to connect to the server.

$SMS,000000; W002,<1>,<2>,<3>;!

<1>: APN(access point) The value contains 0 to 29 characters.

<2>: APN User name: Contains 0 to 29 characters.

<3>: APN Password: Contains 0 to 29 characters.

Note: Parameters can be empty, as shown in Example 2.

Example 1:$SMS,000000;W002,cmnet,username,password;!

Example 2:$SMS,000000;W002,cmnet,,;! (Note: APN user name and password are empty)

4.4 SIM Card Switching

Example:

SMS command: $SMS,000000;W015,<1>,<2>;!

Explanation:

<1>: SIM card switching, range: 1~2(1 for SIM card and 1 for SIM card 2)

<2>: APN (access point). The value contains 0 to 29 characters.

Note: When switching SIM cards, APN can be empty.

Example: Switch to SIM card 1:$SMS,000000;W015,1,;!

Example of reading SIM card information : $SMS,000000;R015;!

4.5 Charging

With a special charger and charging cable, a charging time is about 1.5 -2 hours. Or use a mobile power bank to charge your device.

4.6 Turn ON/OFF

Press and hold the red power button for 5s to generate vibration and then power on the device. Disconnect the wrist strap and hold down the power button for 5 seconds before the device shuts down.

This note only describes how to set parameters using SMS messages.

Note: Please switch to English when entering all instructions, English is not case sensitive; The device accepts only commands with correct passwords and formats. Commands with incorrect passwords and formats are ignored.

5.Reset Password

The initial password of the device is：000000。

SMS command：$SMS,******;W001,######;!

Description: Change the password of a device

Explain：

******：User password, range: 6 characters, Support for upper and lower case digits(Not s upport.**?!@\|;%**），default：000000.

Note: Please switch to English input method when typing commands on mobile phone, E nglish is not case sensitive; The device accepts only the SMS commands with the correct password. The commands with the incorrect password are ignored.

Example: Setting the device password Example:

$SMS,000000;W001,123456;!

Read password example：

$SMS,000000;R001;!

Clear password example：

$SMS,000000;C001;!

6.SMS authorization number

Description: Set an entitlement number and corresponding functions

SMS command：

$SMS,000000;W010,NO.,Phone Number,ABC;!

Parameter specification：

NO	Authorization number serial number	Range:1-3
Phone Number	Authorization number	Range: 0~19 characters
A	Electronic fence function switch	Range: 0 or 1 (0 means off, 1 means on), default: 0
B	Monitor function switch	Range: 0 or 1 (0 means off, 1 means on), default: 0
C	Two-way talk function /SOS emergency help switch	Range: 0 or 1 (0 means off, 1 means on), default: 0

For example, set the number 13800000000 and enable the listening function:

$SMS,000000;W010,1,13800000000,010;!

Example of reading the first set authorization number：

$SMS,000000;R010,1;!

Clear first authorization number example：

$SMS,000000;C010,1;!

Read all authorization numbers example：

$SMS,000000;R010;!

Clear all authorization numbers example：

$SMS,000000;C010;!

7.WIFI positioning

By default, the device automatically turns on WIFI positioning when it turns on, automatically searches for nearby WIFI signals every 5 minutes, selects the 10 WIFI signals with the strongest signal, and uploads positioning information to the platform.

8.SOS Emergency

If you hold the SOS button for 3 seconds or more, the device will vibrate and send an SOS alert to all authorization numbers and servers. If an authorization number is set using the SOS

emergency call function, the device will dial the authorization number one by one, and if the call is answered, it will stop making calls.

9.Real-time tracking

Call tracking：

If an authorized number makes a call to the device, the device returns the location information to the authorized number by SMS message.

Text tracking：

If an authorization number sends a real-time tracking command, the device sends location information to the authorization number by SMS. The tracker will also send alert data to the server if it is set.

Example SMS command：

$SMS,000000;W052;!

10.Platform timing tracking

Setting network functions：

SMS command：

$SMS,000000;W002,APN,Username,Password;W003,IP,Port;W005,X;W009,Y;!

Command explain：

$SMS,000000;W002,APN parameters, user name, password;W003,IP address, server port;W005,upload interval;W009,data upload mode;!

Example：$SMS,000000;W002,cmnet,,;W003,192.168.1.1,8088;W005,1;W009,1;!

Parameter Description：

APN	Service network access point name	range	0~29 characters (local operator's APN)
Username	Username	range	0~29 characters;
Password	Password	range	0~29 characters；
IP	Server IP or domain name	range	0~29 characters；
Port	Server port	range	0~65535
X	GPRS Timed upload interval	range	0~65535, default: 0, unit: 30 seconds, for example: set to 2, that is, the scheduled upload time interval is 2*30=60 seconds.
Y	GPS data upload mode	range	0~2.default:0,0 indicates that the GPRS function is disabled, 1 indicates TCP connection, and 2

			indicates UDP connection

Read GPRS Timing Trace Example：

$SMS,000000;R002;R003;R005;R009;!

Clear GPRS timing trace example：

$SMS,000000;C002;C003;C005;C009;!

11.Data replacement

The built-in 7M Flash memory is used to store data.

When GSM fails to upload data at the scheduled time, the device will automatically store the data in the built-in memory, and when GSM is successfully connected, the device will send the data to the platform server again.

Note: The device preferentially sends real-time data, while the stored data is sent after the meeting.

12.Electronic fence

There are two ways to set up an electronic fence：

1、When the exact center point is known, the latitude and longitude can be directly filled in the instruction;

Example：

$SMS,000000;W018,1,school,22.12345,114.12345,10.50;!

2、When the latitude and longitude displayed in the command position is empty, the device will automatically obtain the latitude and longitude of the last positioning as the center point.

After setting up the electronic fence，When the tracker enters or leaves the preset range, the tracker will send alarm information to the authorized number (the electronic fence function must be turned on when setting the authorized number). If GPRS is connected, the tracker will also send alarm data to the server via GPRS.

Example：

$SMS,000000;W018,1,home,,,10.50;!

SMS command：

$SMS,000000;W018,NO.,name,lat,lng,radius;!

Parameter specification：

NO	Electronic fence serial number	range	1~5

Name	Electronic fence name	range	0~9 characters
Lat	The latitude of the center point of the electronic fence	range	-90.00000000~90.00000000，Unit: degree
Lng	The longitude of the center point of the electronic fence	range	-180.00000000~180.00000000，Unit: degree
Radius	Electronic fence radius	range	0.0~1.79E+308，Unit: m

Note: The electronic fence is an example of a circular area composed of a preset center point and a preset.

Example of SMS command to read the first electronic fence:

$SMS,000000;R018,1;!

Clear first geofence SMS example：

$SMS,000000;C018,1;!

Read all geo-fence SMS examples：

$SMS,000000;R018;!

Clear all geofence SMS examples：

$SMS,000000;C018;!

13.Time zone settings

Set SMS Time zone

SMS command：$SMS,000000;W020,X;!

Parameter specification：

X：time zone value, range：-720~780，default：0 ，Unit: points

Example：

$SMS,000000;W020,480;!

1 hour= 60 minutes, If the time is hours, it must be converted to minutes. For example, GMT+8 is Beijing time zone, 60*8=480 (parameter), so this command means Beijing time.

Example of reading time zone settings：

$SMS,000000;R020;!

Example of clearing time zone settings：

$SMS,000000;C020;!

14.Alarm play Settings

SMS command：$SMS,000000;W043,A,B,C;!

Parameter specification：

A：Turn on/off other sounds except wristband alarm, default is 1(1= turn on alarm sound, 0= Turn off all sounds except wristband alarm) (can be omitted)

B：Turn on/off wristband alarm sound, default is 1 (0= off,1= on) (can be omitted).

C：Whether to play the alarm sound immediately, the default is 0 (0=off,1= play the wristband alarm sound immediately, 2= play the call center).

Example of alarm sound playing Settings：

$SMS,000000;W043,1,1,0;!

Example of alarm play Settings for reading device writes：

$SMS,000000;R043;!

Example of clear alarm play switch：

$SMS,000000;C043;!

15.Low battery alarm

1、When the battery level is less than 20%, the device will send an alarm SMS to all authorized numbers or send alarm data to the platform server.

2、when the battery power is equal to 0%, the device will automatically shut down.

16.Wristband alarm function

1、When the wristband is connected,the device sends a (belt on) alarm message to all a uthorized numbers and sends a message via GPRS
Alarm data to the platform server.

2、When the wristband is opened,the device will send a (belt off) alarm message to all a uthorized numbers and send it through GPRS send alarm data to the platform server.

17.Double-locked

The device has a dual lock with a mechanical lock and a smart Bluetooth lock, allowin g the device to achieve dual protection when both locks are locked at the same time. On ly when both locks are opened at the same time can the device unlock and unlatch the wristband.

Mechanical lock: We can use the standard key to open.

Smart Bluetooth lock:

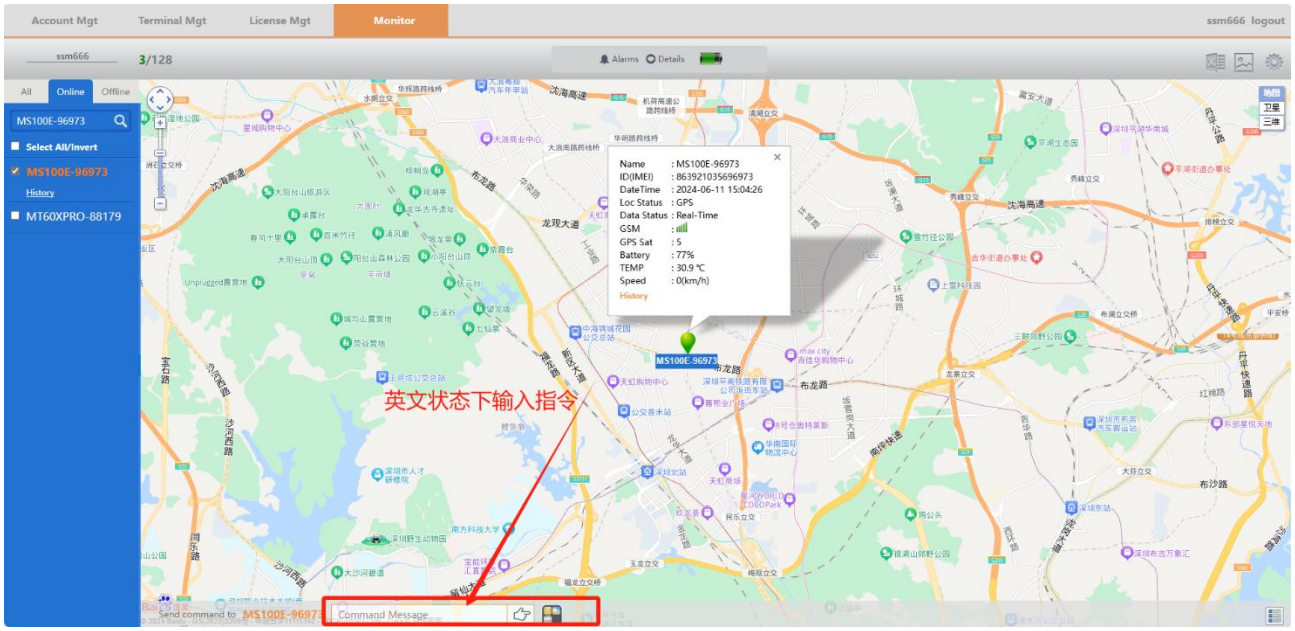
Commands can be sent via SMS /Web platform /sscom serial port tool:

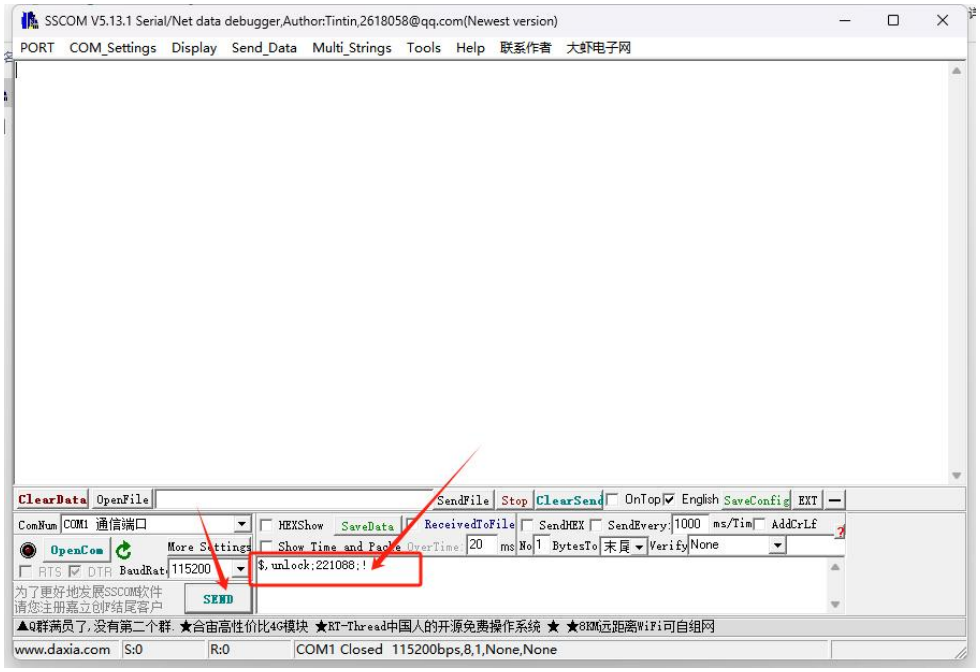
unlock command: $,unlock;221088;!

lock command: $,lock;000000;!

Change unlock password command: $,221088;123456;!($,Old password;New password;!)

The following is an example:





18.The SIM card cover opens the alarm function

A magnetic alarm device is installed behind the SIM card cover. Once the back of the SIM card cover is opened, the device will upload an alarm message to the platform and terminal A message is displayed indicating that the device SIM card cover has been opened.

19. Beacon coordination instructions

(1). Fix the Beacon on the wall, and place the front screen print numbers facing upward. As shown in the figure

(2). Turn on Beacon and turn on MS140 device

(3). Input command bind Beacon MAC address:

Serial port input：$USB,000000;W042,c3:00:00:22:66:ec,,;!

SMS input:：$SMS,000000;W042,c3:00:00:22:66:ec,,;!

Platform input:：$GPRS,Device IMEI;W042,c3:00:00:22:66:ec,,;!

Note: Write once, restart and shutdown do not affect; Bluetooth MAC addresses are entered in lowercase letters,and only the first one can be written.

(4). After the Beacon is bound, MS140 will start to scan the Mac address of the Beacon and the data of the sensor receiving the Beacon, the scanning interval is 60S. During this period, if the scanning fails or the scanning value of the Beacon is different from the initial value of the Beacon, the device will start to alarm and upload it to the platform.

(5). Query Beacon binding information

$USB,000000;R042;!

$SMS,000000;R042;!

$GPRS,IMEI;R042;!

Sending this command will reply: $IMEI,R042,OK,Beacon MAC address,,;!

(6). Clear binding information

$USB,000000;C042;!

$SMS,000000;C042;!

$GPRS,IMEI;C042;!

After sending this command, it will reply: $IMEI,C042,OK;!

20.Working mode

The working mode is divided into three types: personal mode, smart mode and car mode

SMS command：$SMS,000000;W016,X;!

Parameter specification：

X	Work mode	Range	0~2（0 for Personal mode, 1 for smart mode, 2 for in-vehicle mode) Default 1

Personal mode：

When there is data update or alarm, GPS will automatically start positioning, positioning success or positioning timeout GPS will be closed.

The device then uploads the updated data or sends an alarm message.

Smart mode：

GPS is always working when the device is moving, and automatically goes to sleep when the device is stationary, when new data or reports are available.

When an alarm is generated, GPS will automatically start positioning, positioning success or positioning timeout GPS will be turned off, and then the device will upload the updated data or send an alarm message.

Car mode：

The GPS does not turn off whether the device is moving or not.

Example：

Example of setting the device to smart mode：

$SMS,000000:W016,1;!

Read Device Mode Example：

$SMS,000000:R016,1;!

Clear Device Mode Example：

$SMS,000000:C016,1;!

21.Problems and failures

Fault: The device does not turn on	
Possible reason	Solution
Power switch operation problem	Make sure to press the read power button for more than 5s
battery needs charging	Charge the device for 1.5-2 hours
Trouble: Device does not reply to text messages	
Possible reason	Solution
Bad GSM signal	Make sure the device is located with a good GSM signal, check the installation of the SIM card, and replace the SIM card if necessary
busy network	Waiting for text messages, the network may be slow to respond during busy times or device failures
wrong password or wrong command	Use the correct password and SMS format
Insufficient SIM balance	Replace or recharge your SIM card
Low battery	Charge the device
Trouble: Unable to connect to server via GPRS	
Possible reason	Solution
SIM does not support 4G function	Activate the 4G function of the SIM card
4G function is turned off	Turn on 4G function
Incorrect IP address or port number	Set the correct IP address and port number, then reboot
4G signal is weak	Move the device to a place with good signal
APN parameter error	Confirm the APN parameters of the SIM card and set them again
GPRS communication mode error	Re-select the corresponding communication mode connection,1 indicates TCP connection,2 indicates UDP connection