MEITRACK T400G TPMS Scheme User Guide

Applicable Model: T400G

Change History

File Name	MEITRACK T400G TPMS Scheme User Guide		
Project	T400G	Creation Date Update Date	2019-04-01
Subproject	User Guide	Total Pages	44
Version	V1.0	Confidential	External Documentation

Contents

1 Copyright and Disclaimer

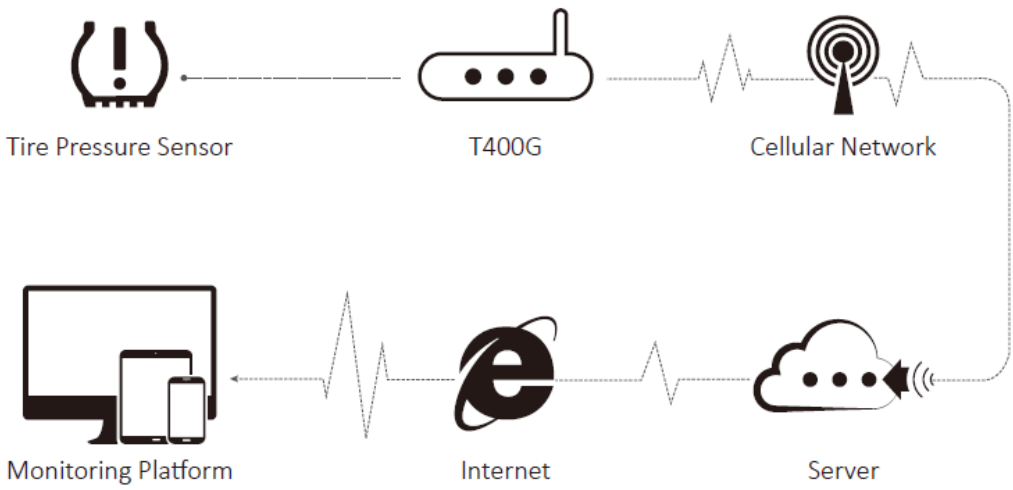
2 Product Introduction

2.1 Product Overview

High land surface temperature and ambient temperature could be one of the causes of a flat tire. When a tire is abnormal, if drivers know the tire's condition in advance, they can take measures in a timely manner, thus preventing accidents.

The T400G tire pressure monitoring system (TPMS) scheme is designed to monitor vehicle tires in real time and provide an early warning for any form of abnormal conditions. After the tire pressure sensor is installed on the position where tire's valve stem locates, tire pressure and temperature data will be sent to the tracker via the wireless transmitter. These data can be obtained from the MS03 web platform or MS03 app. When the tire pressure is too low or a tire leaks air, an alert will be automatically sent.

2.2 T400G Scheme Diagram



2.3 Product Functions

- Monitor tire pressure and temperature in real time.
- High pressure alert
- Low pressure alert
- High temperature alert
- Fast air leak alert
- Slow air leak alert
- Tire inflation alert
- Low battery alert
- Tire pressure or temperature line chart statistics report

3 Product Specifications

3.1 T400G Tracker Specifications

Item	Specifications
Dimension	105 mm x 65 mm x 26 mm
Weight	190g
Power supply	DC 11–36 V/1.5 A
Backup battery	400 mAh/3.7 V
Power consumption	Current in standby (sleep) mode: 5 mA Current in normal working mode: 65 mA
Operating temperature	-20°C to 55°C
Operating humidity	5%–95%
Working hour	Power-saving mode: 47 hours Normal working mode: 4.7 hours
LED Indicator	Green indicator showing the GSM signal Blue indicator showing the GPS signal
Button/Switch	1 SOS button (used to send SMS messages or make phone calls) 1 power button
Memory	8 MB
Sensor	3-axis accelerometer (used to wake the device up by vibration and detect towing alerts)
Frequency band	T400G-E: UMTS/HSDPA: 900/2100 MHz GSM/GPRS: 900/1800 MHz T400G-A: UMTS/HSDPA: 850/1900 MHz GSM/GPRS: 850/900/1800/1900 MHz T400G-T: UMTS/HSDPA: 850/2100 MHz GSM: 850/900/1800/1900 MHz Note: Please select a proper device according to the local frequency band.

GPS sensitivity	-161 dB
Positioning accuracy	2.5 meters
I/O port	3 digital inputs (2 negative inputs and 1 positive input) 2 analog detection inputs 2 outputs 1 RS232 port (used to connect a tire pressure receiver) 1 USB port 1 1-Wire port (used to connect a digital temperature sensor or iButton reader)

3.2 Tire Pressure Sensor Specifications

Item	Specifications
Operating temperature	-40°C to 80°C
Storage temperature	-40°C to 85°C
Pressure range	0–8 bar (small vehicles) 0–13 bar (large vehicles)
Pressure accuracy	±0.1 bar (±1.5 psi)
Temperature accuracy	±3°C
Temperature measuring range	-20°C to 90°C
Transmitting power	< 10 dBm
Transmitting frequency	433.92 MHz
Battery life	External tire pressure sensor: ≥ 2 years Internal tire pressure sensor: ≥ 5 years
Dimension	External tire pressure sensor SO (small vehicles): 18 mm in diameter; 17 mm in height Internal tire pressure sensor SI (small vehicles): 60 mm x 31 mm x 21 mm (L x W x H) External tire pressure sensor SH (large vehicles): 24 mm in diameter; 29 mm in height External tire pressure sensor ST (large vehicles): 52 mm x 26 mm x 25 mm (L x W x H) Internal tire pressure sensor SR (large vehicles): 60 mm x 31 mm x 20 mm (L x W x H)
Weight	External tire pressure sensor SO (small vehicles): 12g Internal tire pressure sensor SI (small vehicles): 54g External tire pressure sensor SH (large vehicles): 15g External tire pressure sensor ST (large vehicles): 22g Internal tire pressure sensor SR (large vehicles): 77g

3.3 Working Mode of a Tire Pressure Sensor

Normal working mode: When a tire pressure sensor detects that the vehicle is moving or detects vibration, tire

pressure data will be updated at 5-minute intervals.

Sleep mode: When the tire pressure sensor detects that a vehicle does not move for 15 consecutive minutes, it will enter smart sleep mode automatically and tire pressure data will not be updated.

When the tire pressure sensor is in any of the above working modes, tire pressure data will be uploaded immediately once an alert is sent.

4 Main Device and Accessories

4.1 Standard Accessories

T400G tracker	Tire pressure receiver (with a 4-pin RS232 port)
I/O cable (2 meters; including an SOS button)	External GPS antenna
External 3G antenna	USB cable
8-pin to 4-pin cable	CD download card

4.2 Tire Pressure Sensor (Optional Accessories)

External tire pressure sensor SO (small vehicles)

Internal tire pressure sensor SI (small vehicles)

External tire pressure sensor ST (large vehicles)

External tire pressure sensor SH (large vehicles)

Internal tire pressure sensor SR (large vehicles)

4.3 Other Optional Accessories

Repeater	LCD display
A52 digital temperature sensor + A61 sensor box	iButton
A53 fuel level sensor (voltage AD)	Relay (12 V/24 V)
A54 capacitive level sensor (CLS)	

5 Device Installation

5.1 Installing GPS and 3G Antennas

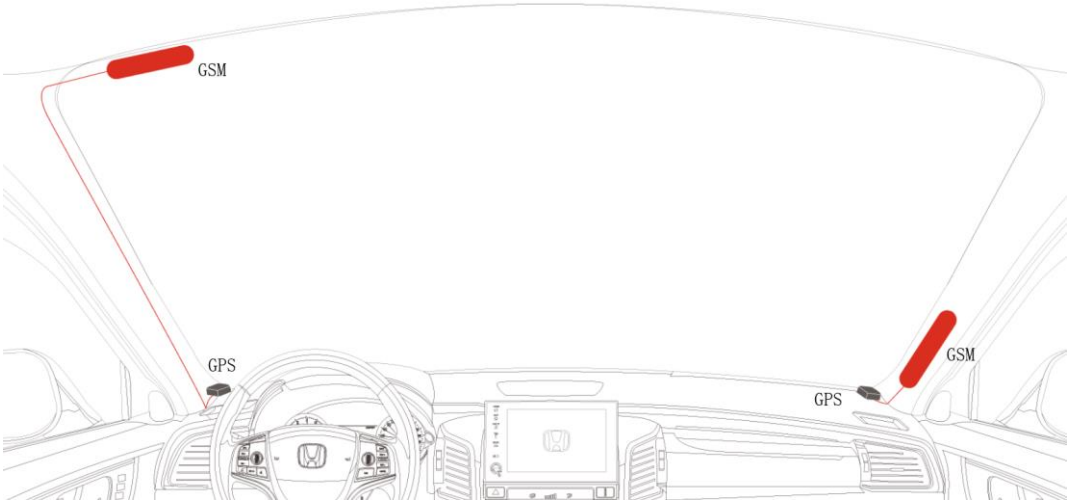
3G antenna 

GPS antenna

Connect the 3G antenna to the tracker's connector which is labeled "GSM". The 3G antenna is non-directional, so you can hide it in any place of a vehicle.

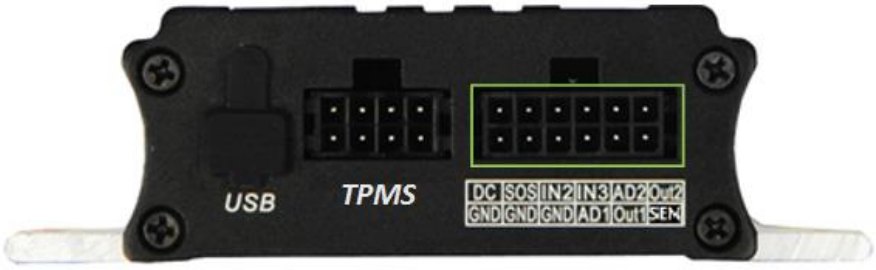
Connect the GPS antenna to the tracker's connector which is labeled "GPS". It is recommended that the GPS antenna should face up to the sky and the side of the GPS antenna with words should face downwards. Please secure the GPS antenna by using double sided tapes.

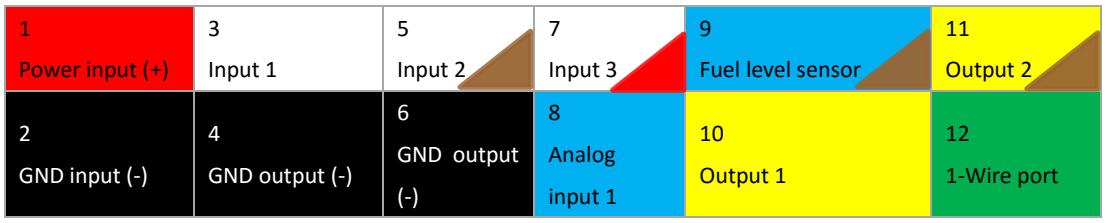
Note: Do not install the GPS antenna at a metal covered place. You are advised to install the GPS and 3G antennas as shown in the following figure.



5.2 Installing the I/O Cable

The I/O cable is a 12-pin cable, including the power, analog input, digital temperature sensor input, positive input, negative input, and output ports.



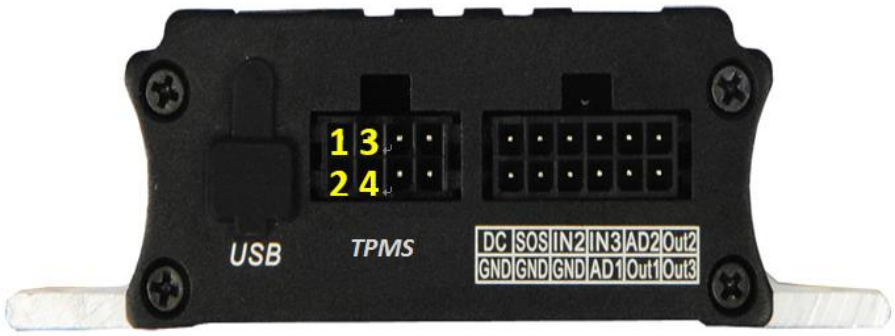


Pin Number	Color	Description
1 (Power +)	Red	Positive charge of the power input, connected to the positive charge of the vehicle battery. Input voltage: 11–36 V. 12 V is recommended.
2 (GND)	Black	Ground wire, connected to the negative charge of the vehicle battery or to the negative terminal.
3 (Input 1)	White	Digital input 1; negative trigger (SOS button by default)
4 (GND output)	Black	Ground wire, connected to input 1 (SOS button)
5 (Input 2)	White & brown	Digital input 2; negative trigger Connect to a door trigger signal cable to detect vehicle door status. (Most Chinese, Korean, and Japanese vehicles are negative edge-triggered.)
6 (GND output)	Black	Ground wire It can be used as a ground wire connected to an analog sensor.
7 (Input 3)	White & red	Digital input 3; positive trigger Connect to the vehicle ACC cable by default to detect the vehicle ACC status.
8 (Analog input 1)	Blue	Analog input 1 with 12-bit resolution; valid voltage: 0–6.6 V Connect to an external sensor, such as the fuel level sensor.
9 (Fuel level sensor input)	Blue & brown	Analog input 2 with 12-bit resolution; valid voltage: 0–6.6 V There is a white plug on the AD cable, and the cable is connected to the A53 fuel level sensor by default.
10 (Output 1)	Yellow	Output 1 Valid: low level (0 V) Invalid: open collector Maximum voltage for output open collector (invalid): 40 V Maximum current for output low voltage (valid): 400 mA Connect to an external relay to remotely cut off the vehicle fuel cable or engine power supply.
11 (Output 2)	Yellow & brown	Output 2 Valid: low level (0 V) Invalid: open collector Maximum voltage for output open collector (invalid): 40 V Maximum current for output low voltage (valid): 400 mA Connect to an external relay to remotely cut off the vehicle fuel cable or engine power supply.
12 (1-Wire port)	Green	TTL3.3V level Connect to the A52 digital temperature sensor or iButton reader by default by using the A61 sensor box. Note: The DC or AC voltage that is greater than 3.3 V is not allowed.

		Otherwise, the device may be damaged.

5.3 Installing the Tire Pressure Receiver

The tire pressure receiver is equipped with a 4-pin RS232 port. The T400G tracker's RS232 port is shown in the following figure:



Pin No.	Color	Description (Tire Pressure Receiver)
1	Red	Power output Output voltage: 5 V
2	Black	Ground wire
3	Green	RX (T400G receives data through the port)
4	White	TX (T400G sends data through the port)

Connect the tire pressure receiver to the T400G:

1. Plug the 8-pin port of the 8-pin to 4-pin cable into the T400G.

2. Plug the other port of the 8-pin to 4-pin cable into the tire pressure receiver.

Note: To make sure that the tire pressure receiver can work normally, the T400G must be connected to an external power supply.

The wiring figure is as follows:

Ensure that the tracker is connected to an external power supply and the distance between the receiver and vehicle tires is less than 10 meters. If this distance exceeds 10 meters, a repeater is required to be installed.

5.4 Installing the Tire Pressure Sensor

Before installing a tire pressure sensor inside a tire, please configure the tire pressure sensor.

5.4.1 Configuring the Tire Pressure Sensor by Meitrack Manager

Before configuring a tire pressure sensor, please remember the ID number printed on its surface.

For example, the following tire pressure sensor's ID number is **E01388**.

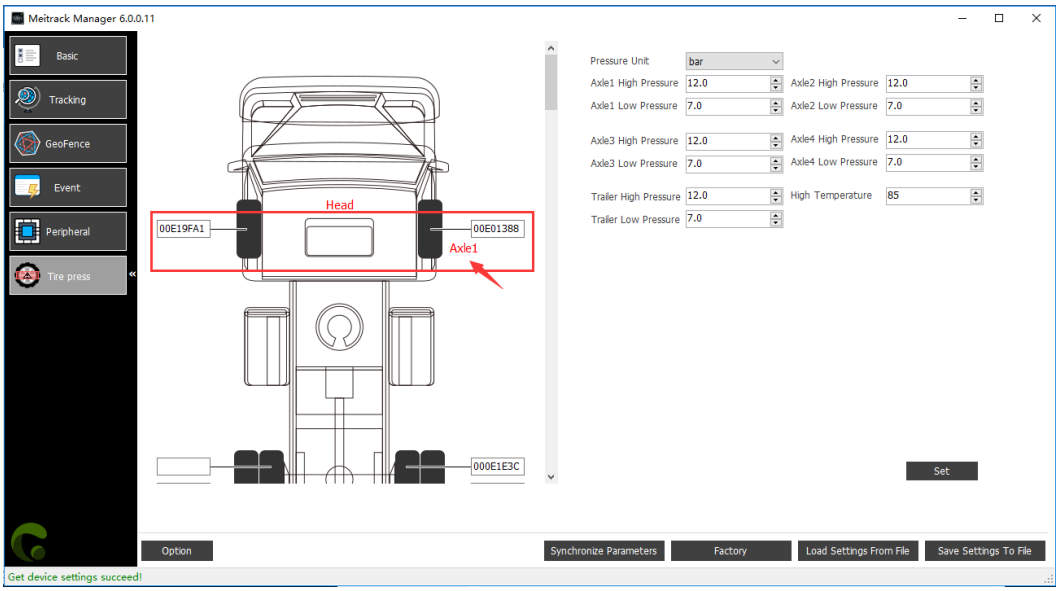
The vehicle's head part is important. So set the alert values for tires of the 4 axles on the vehicle's head part, as shown in the following figure.

On the **Tire Pressure** tab page, select tires to be bound, enter the ID numbers of the corresponding tire pressure sensors, and click **Set**.

If you want to unbind a tire and a tire pressure sensor, delete the tire pressure sensor's ID number.

In general, the tire pressure of large trucks is 7–12 bar, while the tire pressure of private cars is 2.2–2.5 bar. The tire pressure varies depending on the vehicle type. In high temperature environments, if you drive a vehicle for a long time, the tire temperature can reach more than 80°C. As the outside air temperature increases, the tire pressure will increase. Therefore, you need to set tire pressure and temperature alert thresholds based on actual conditions.

Before the next configuration step, ensure that the tire pressure receiver has been installed properly.



Use a large vehicle as an example. As shown in the above figure, bind the first tire on the vehicle's head part to the tire pressure sensor whose ID number is E01388, and bind the second tire to the tire pressure sensor whose ID number is E19FA1. In addition, set the high pressure thresholds of 4 axles and the trailer to 12 bar, the low pressure thresholds of 4 axles and the trailer to 7 bar and the high temperature threshold to 85°C.

Note: If the tire pressure receiver is not installed properly, you will fail to configure tire pressure sensors.

5.4.2 Installing an External Tire Pressure Sensor

Visit https://youtu.be/1jYJGVT0ezw to view Meitrack Tire Pressure Sensor Installation Video.

Perform the following steps to install an external tire pressure sensor:

(1) Unscrew the valve stem cap.

(2) Screw the lock nut onto the valve stem.

(3) Install the external tire pressure sensor.

(4) Fasten the lock nut anticlockwise by clamp to prevent sensor theft.

(5) Drive the vehicle to test whether the sensor is installed tightly.

5.4.3 Installing an Internal Tire Pressure Sensor

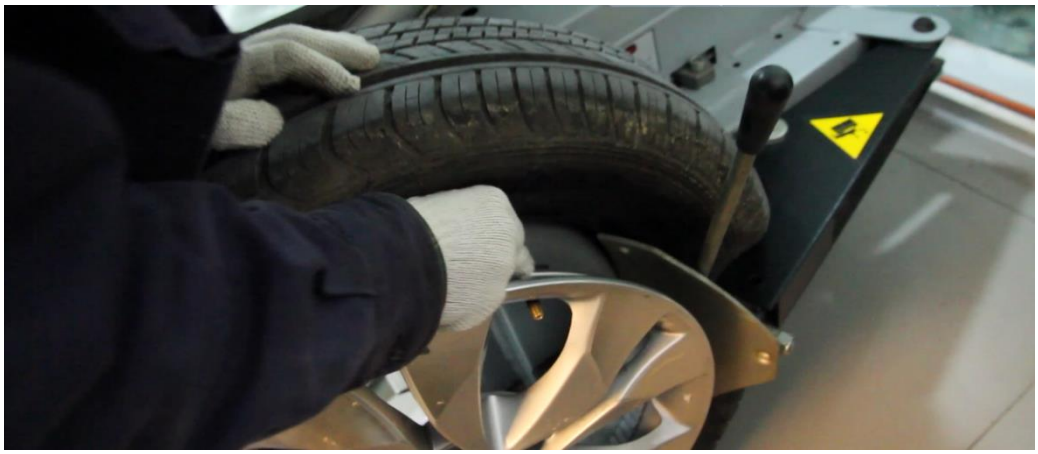
The installation method of internal tire pressure sensors is complicated. Therefore, it is recommended that you should find the staff of a 4S car shop or professional vehicle installation company to install them.

Perform the following steps to install an internal tire pressure sensor:

(1) Remove a tire from the vehicle.

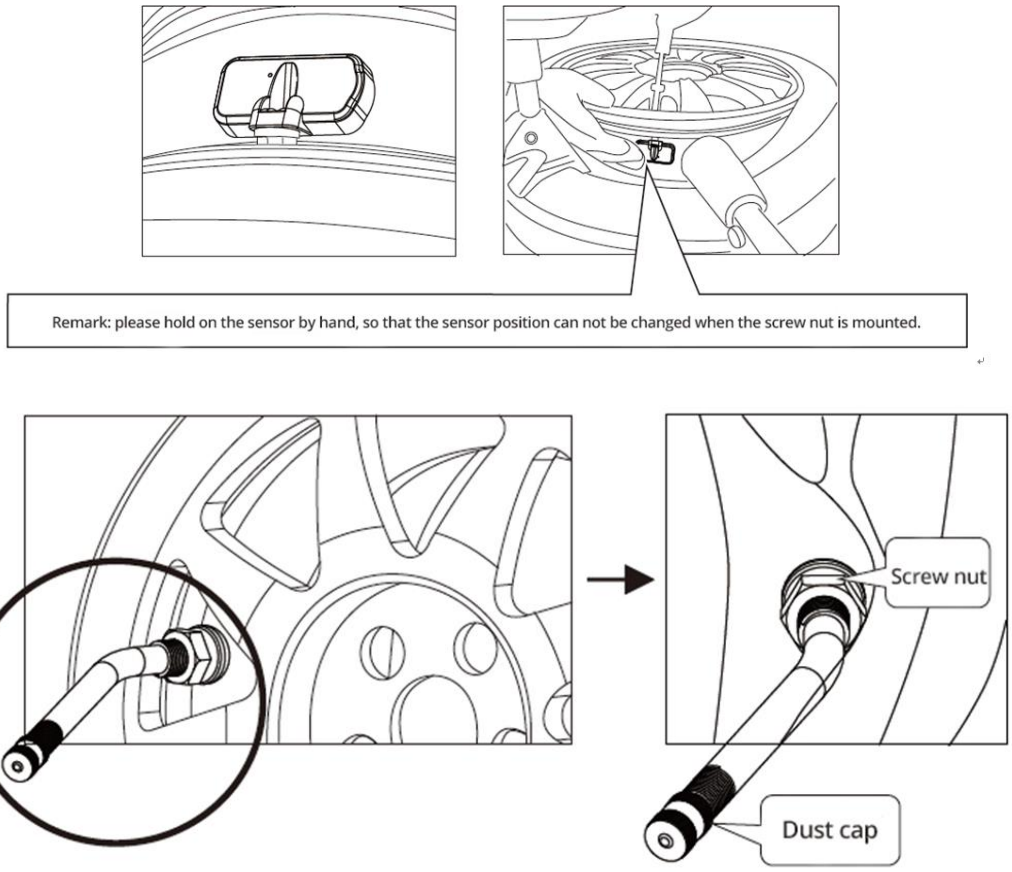
(2) Deflate the tire and place it on the tire changer.

(3) Remove the tire from the wheel rim and shovel the original tire valve.



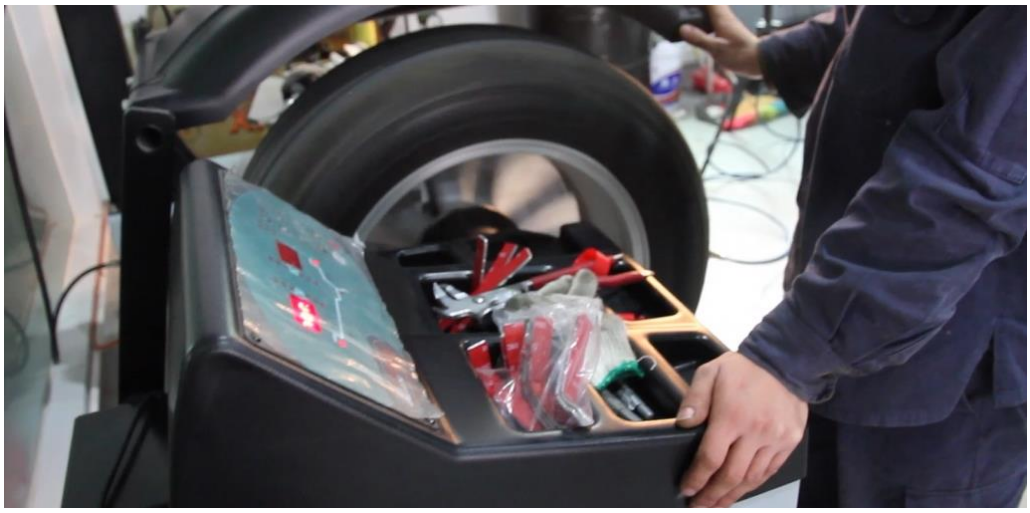
(4) Install and fasten the sensor tail and valve stem.

As shown in the following figure, the sensor tail is installed inwards, the valve stem is installed outwards, and the nut is fastened.



(5) Inflate the tire at proper tire pressure and rotate the tire to detect dynamic balance.

Confirm whether the sensor is installed tightly and check whether the tire can be mounted to the vehicle.



5.5 Installing the Repeater (Optional)

When a truck has too many containers, maybe the tire pressure receiver cannot receive data from the tire pressure sensor mounted on the truck's head part due to a long transmission distance. In this way, you can install a repeater in the middle container of the truck so that the signal can cover longer distances. And you must connect the repeater to an external power supply (12 V). In general, when the transmission distance exceeds 10 meters, a repeater is

required to be installed.

Repeater (only has a red power cable and a black power cable)

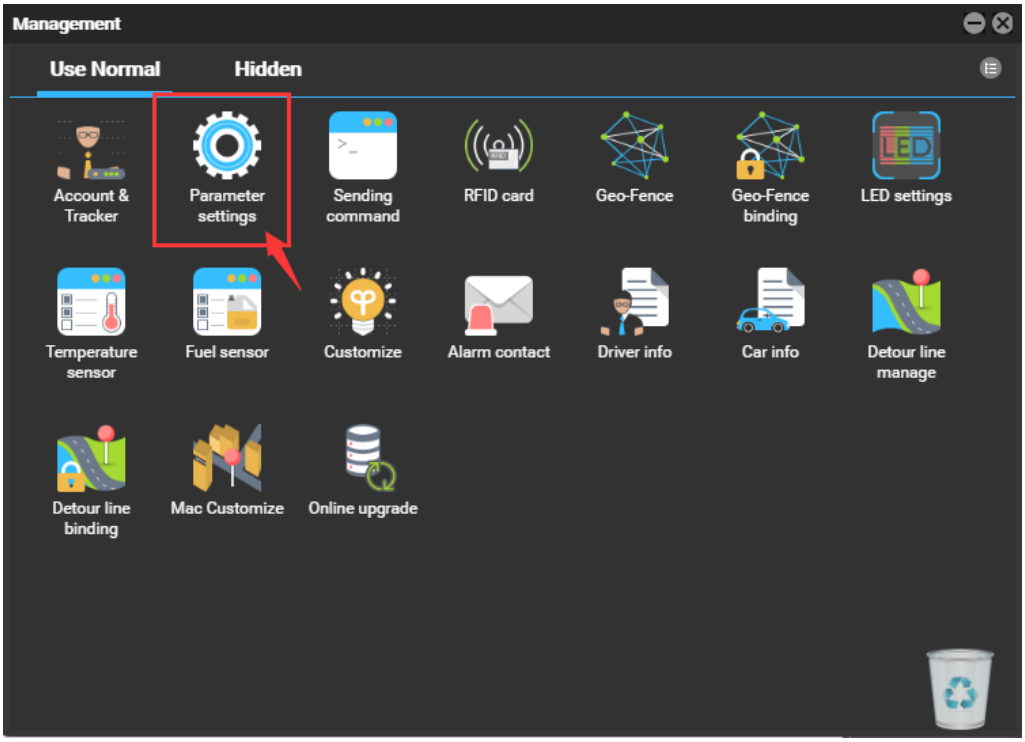
6 MS03 Web Platform

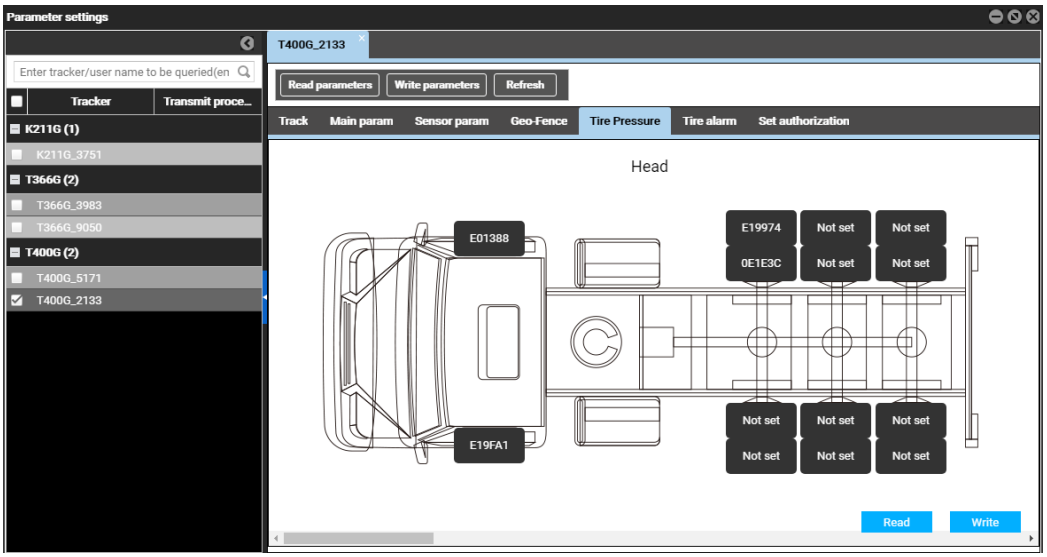
In the TPMS solution, devices can be managed and monitored in real time by using the MS03 platform. The MS03 platform is not only used to configure device parameters, but also monitor tires in real time and query tire pressure and temperature changes during specific time period from reports.

Visit http://ms03.trackingmate.com, enter the user name and password, and log in to the MS03. (Please purchase a login account from your supplier.)

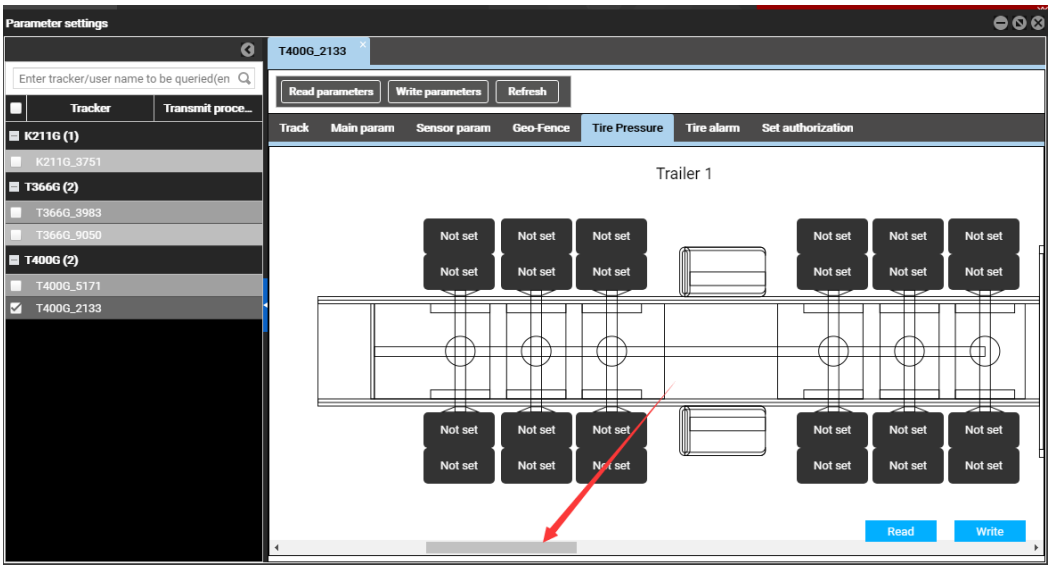
6.1 Configuring the Tire Pressure Sensor by MS03 Web Platform

Before configuring a tire pressure sensor by MS03 platform, you need to set the platform server IP address and port (IP address: 67.203.15.7; port: 10003) by Meitrack Manager or SMS. After confirming that the tracker is online on the MS03 platform, choose **Management** on the main interface. On the **Management** window that is displayed, select **Parameter settings** from **Use Normal**. Then set related parameters on the **Tire pressure** and **Tire alarm** tab pages. The parameter settings page is as follows:



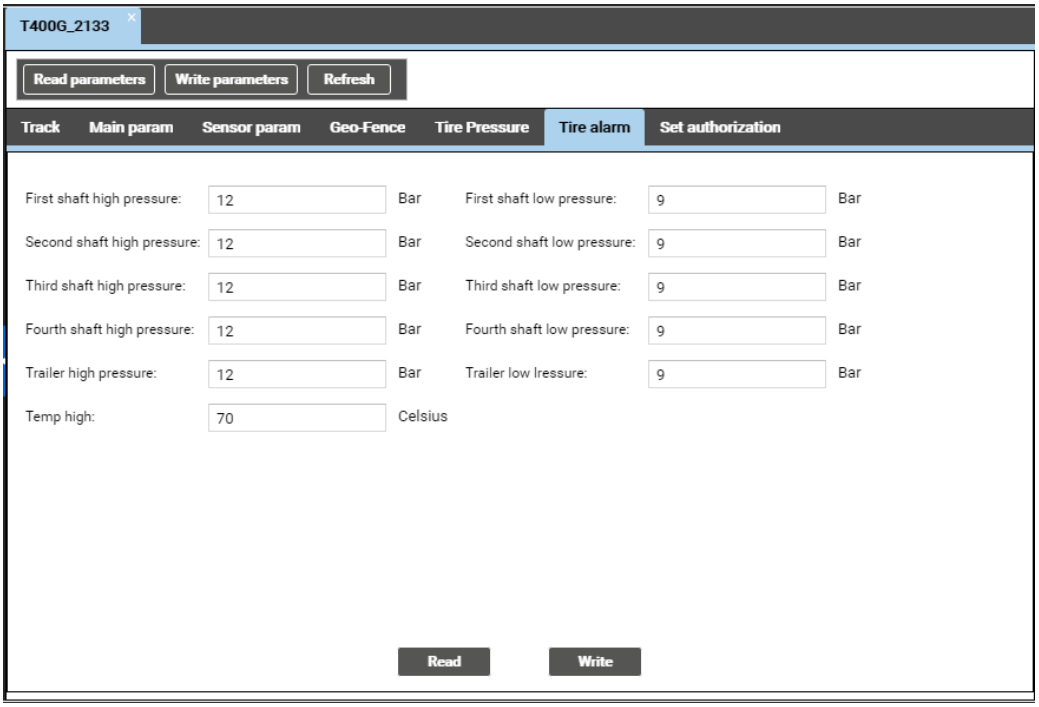


As shown in the above figure, the third tire on the vehicle's head part is bound to the tire pressure sensor whose ID number is E19974, and the fourth tire is bound to the tire pressure sensor whose ID number is OE1E3C. After the tires on the vehicle's head part are bound, you can move the horizontal scroll bar to bind the tires of four trailers.



The method for setting tires of trailers is the same as that of tires on the vehicle's head part.

After the tires are bound to tire pressure sensors, you need to set the alert thresholds. Click the **Tire alarm** tab. On the tab page that is displayed, set the thresholds of high pressure, low pressure, and high temperature alerts, as shown in the following figure.



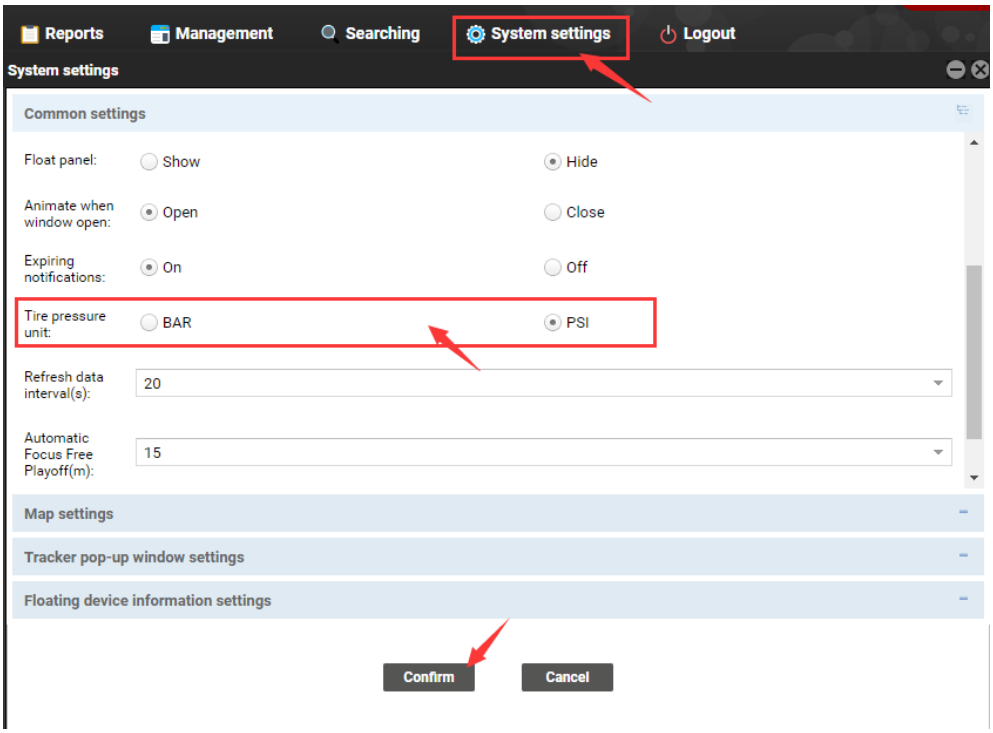
As shown in the above figure, all the high pressure thresholds are set to 12 bar, all the low pressure thresholds are set to 9 bar, and the high temperature threshold is set to 70°C.

Note: If you use Meitrack Manager to configure tire pressure sensors, you must connect the tracker to a computer by USB cable. If you use the MS03 platform, you must ensure that the tracker is online. However, the two configuration methods are nearly the same.

6.2 Setting the Tire Pressure Unit

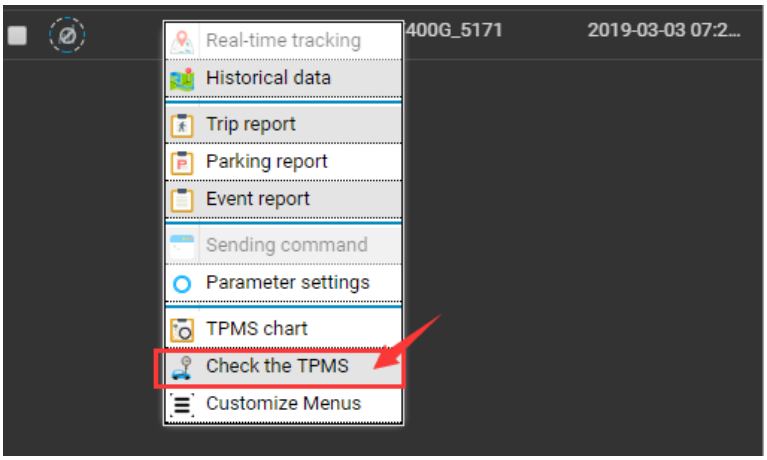
The MS03 platform supports two tire pressure units: BAR and PSI. You can set the tire pressure unit on the **System settings** page, as shown in the following figure.

Note: After the tire pressure unit is set, this setting will take effect on configuration pages and report pages.

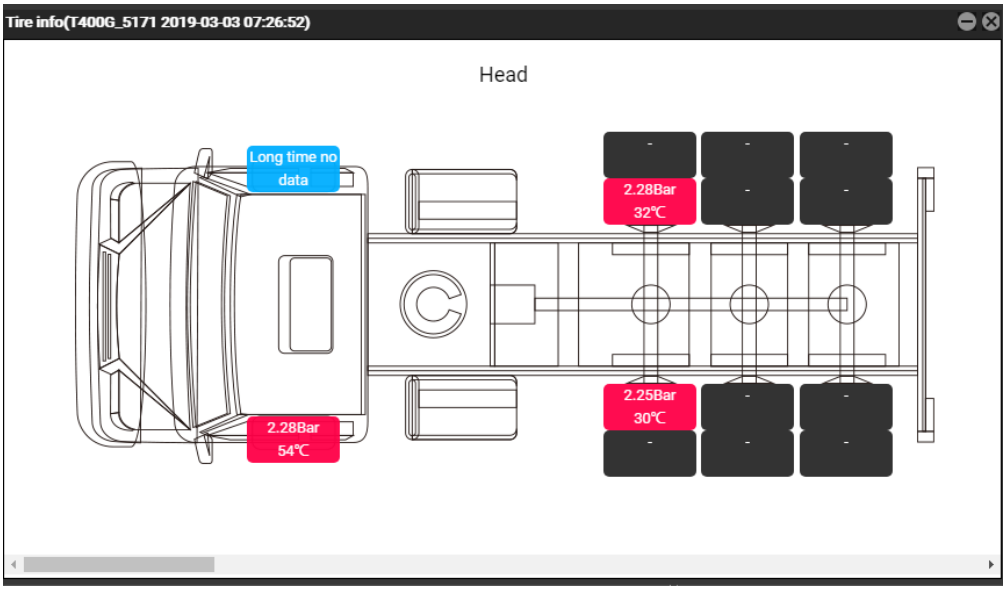


6.3 Real-time Monitoring by MS03 Web Platform

As shown in the following figure, right-click a tracker and select **Check the TPMS** to view the latest tire pressure sensor data.

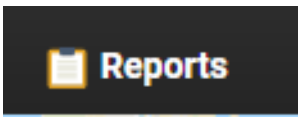


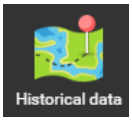
On the page that is displayed, a red area indicates that an alert is generated, and a black area indicates no alert is generated. Move the mouse to a red area, the alert details will be displayed.



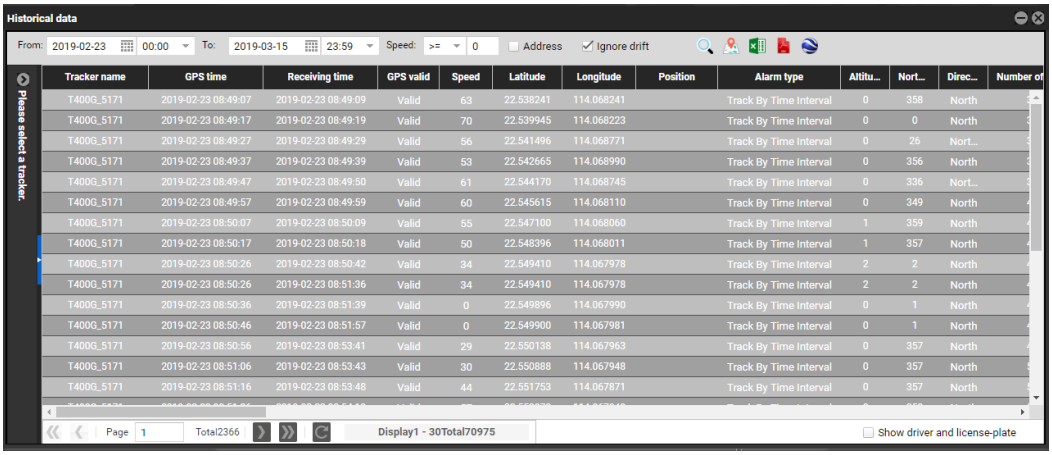
6.4 Querying Historical Data by MS03 Web Platform

On the main interface, choose **Reports** > **Historical data**.

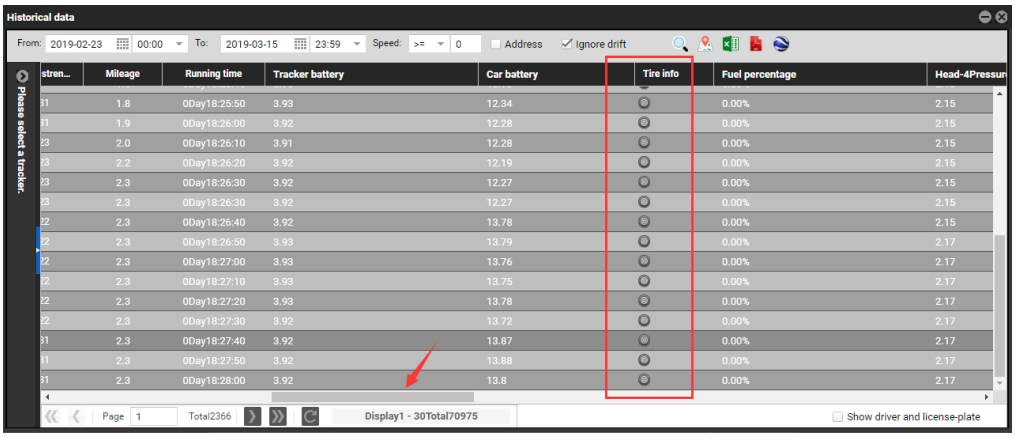


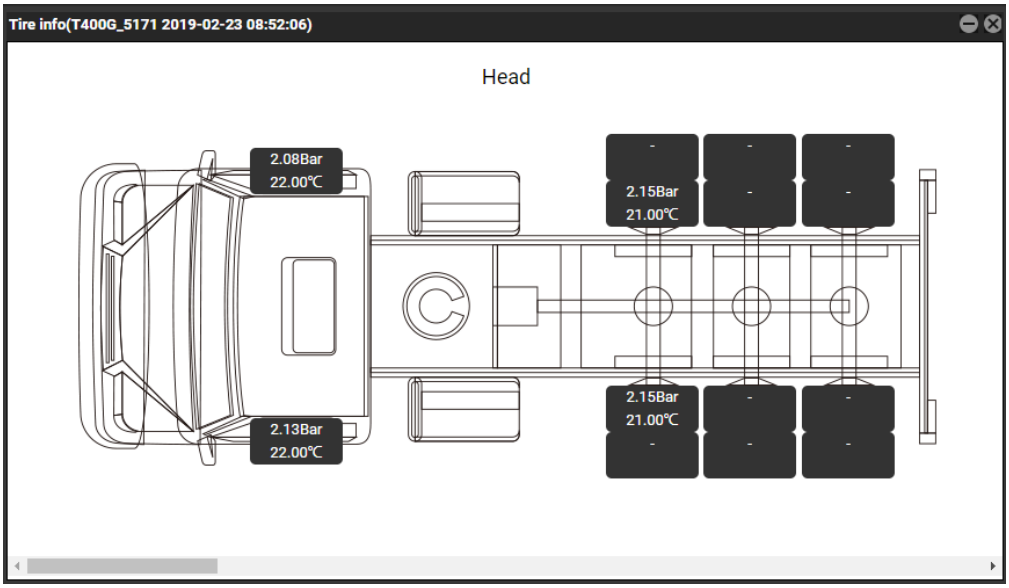


When a tracker is online, you can query related historical data, as shown in the following figure.



Drag the horizontal scroll bar, locate **Tire info**, and click a tire info icon. Then the **Tire info** page is displayed, as shown in the following figure.





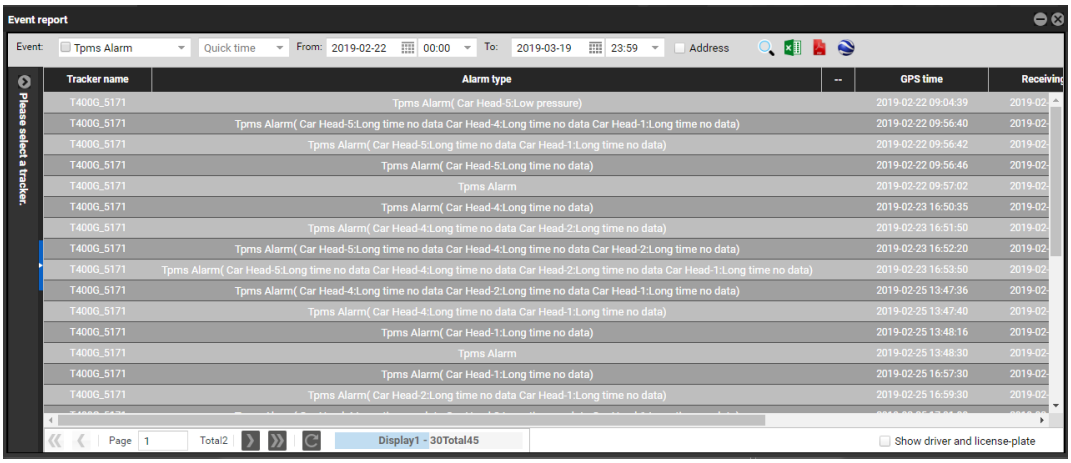
You can get temperature and tire pressure inside tires bound to tire pressure sensors from the above figure.

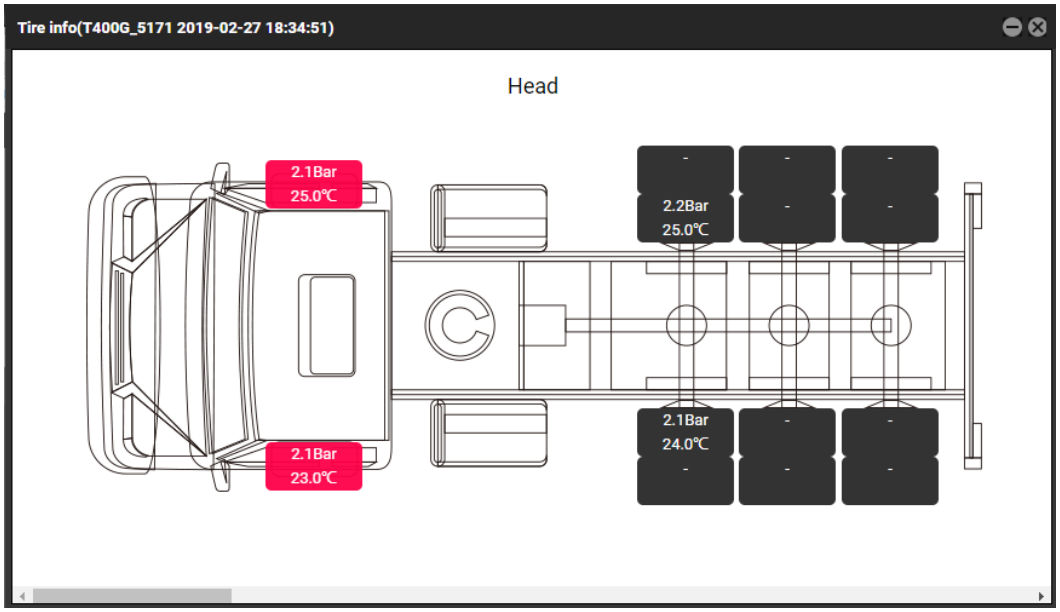
Besides the high pressure, low pressure, and high temperature alerts, there are the following alerts:

- When the decrease rate of tire pressure exceeds 0.2 bar/s, a fast air leak alert will be showed on the MS03 platform.
- When the decrease rate of tire pressure is between 0.05 bar/s and 0.2 bar/s, a slow air leak alert will be showed on the MS03 platform.
- When the increase rate of tire pressure exceeds 0.2 bar/s, a tire inflation alert will be showed on the MS03 platform.
- When a tire pressure sensor's power is too low, a low battery alert will be showed on the MS03 platform. Please replace the battery with a new one.

6.5 Querying Event Reports by MS03 Web Platform

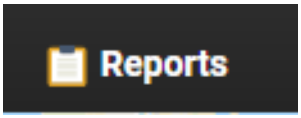
On the **Event report** page, you can view tire alerts of related trackers. As shown in the following figure, double-click a report to enter a graphical interface.



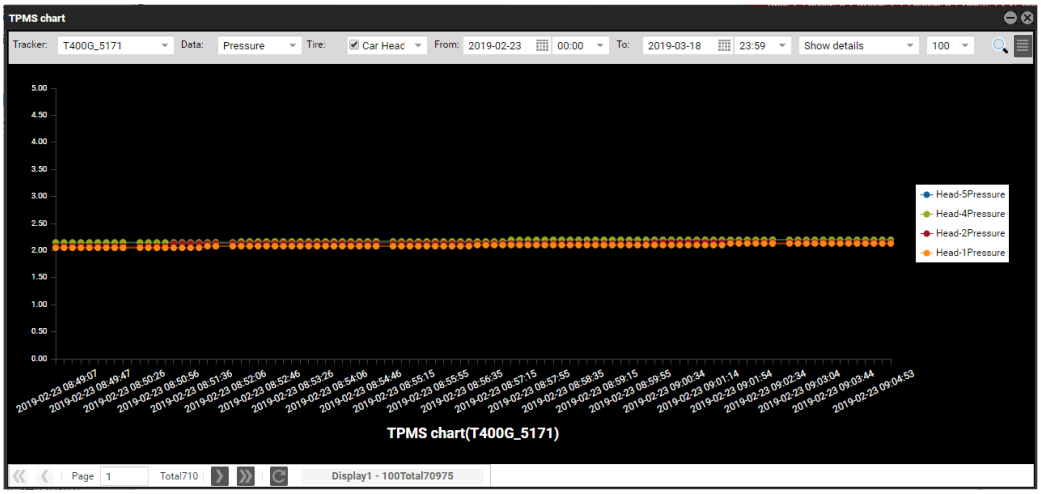


6.6 Querying Tire Pressure Reports by MS03 Web Platform

On the main interface, choose **Reports** > **TPMS chart**.



To view tire pressure or temperature changes during a specific time period, select a tracker, set the data type (tire pressure or temperature), select a tire, and set the time period.



7 MS03 App

Download the MS03 app:

Scan the following QR code to download the MS03 app.

MS03 app for Android

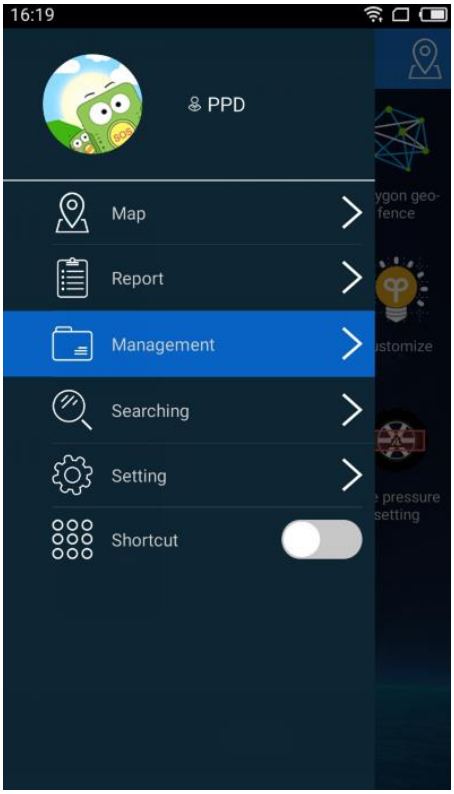
MS03 app for iOS

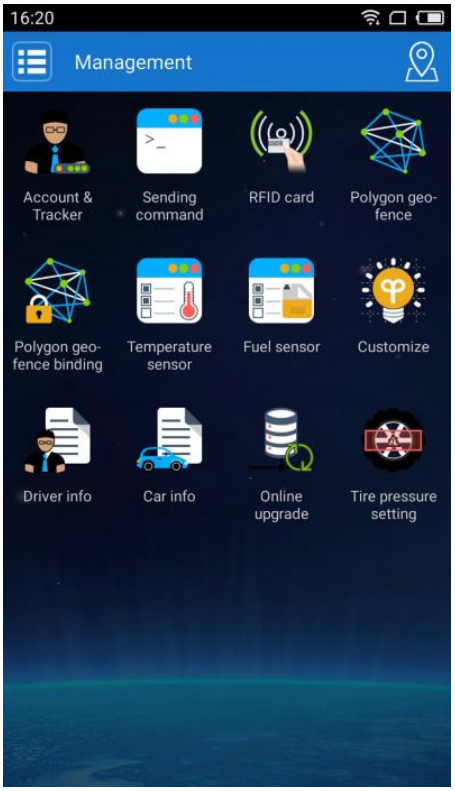
Note: Please use your MS03 account to log in to the app.

7.1 Configuring the Tire Pressure Sensor by MS03 App

Perform the following steps to configure a tire pressure sensor:

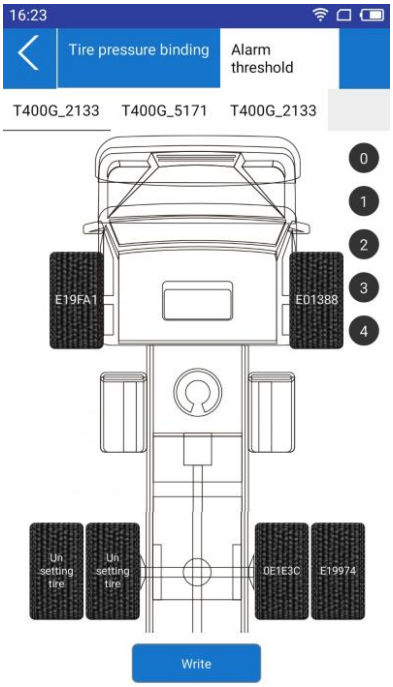
1. Log in to the MS03 app, click the icon in the upper left corner of the main interface, and choose **Management** > **Tire pressure setting**.

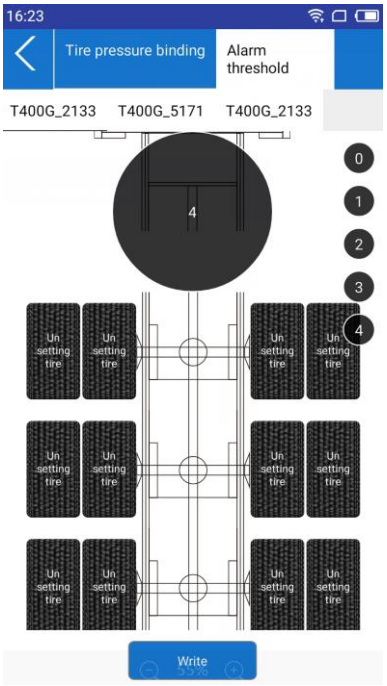




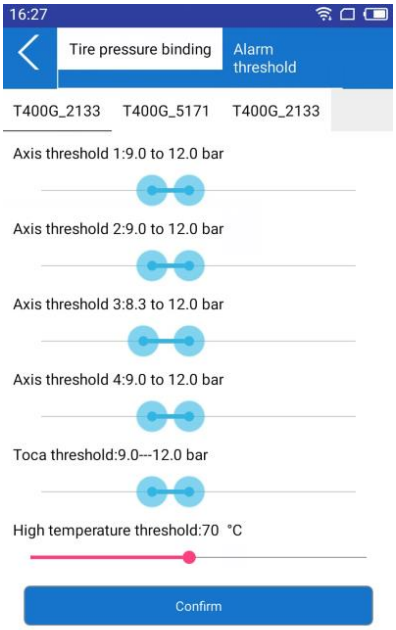
2. Bind tires to tire pressure sensors.

Select tires, and enter the ID numbers of tire pressure sensors to be bound. If you want to configure a trailer, click a button on the right, for example, button 4. The page of trailer 4 will be displayed.



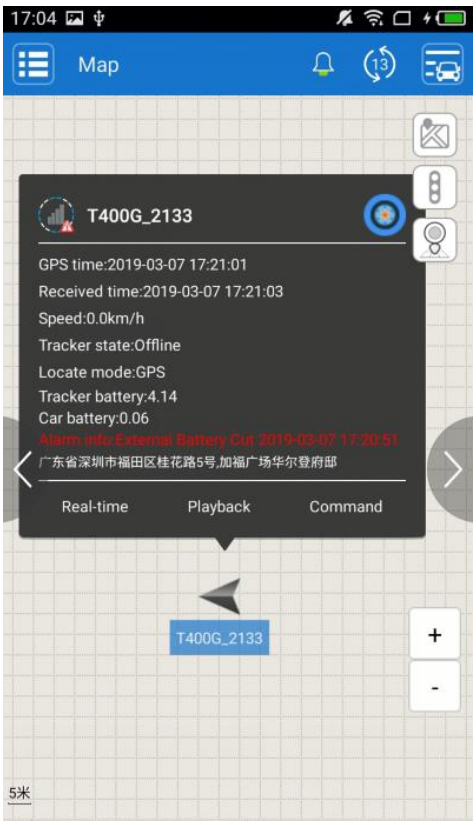


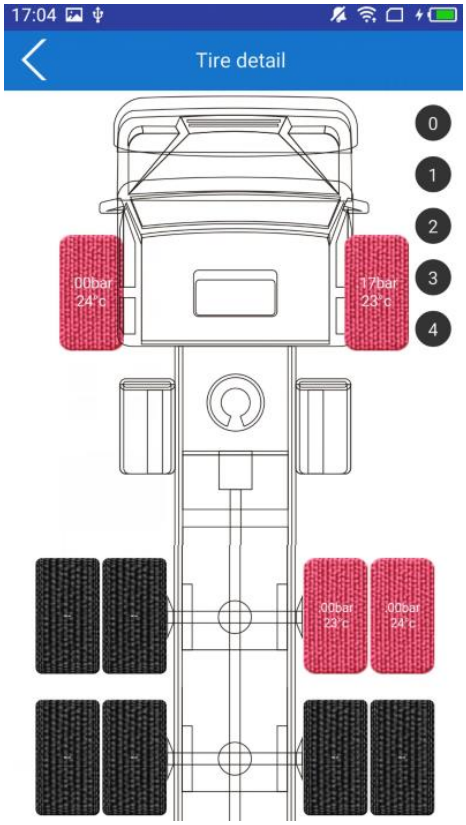
3. Set alert thresholds.

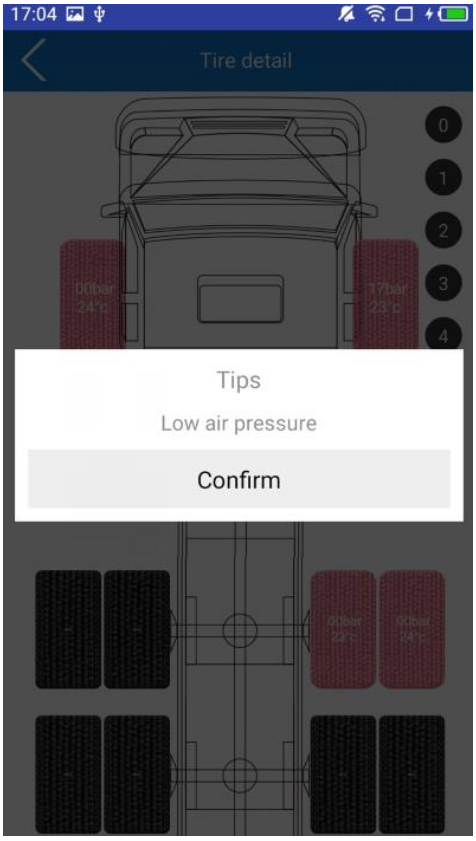


7.2 Real-time Monitoring by MS03 App

To monitor tires in real time, log in to the MS03 app and click the tire icon  on the map.

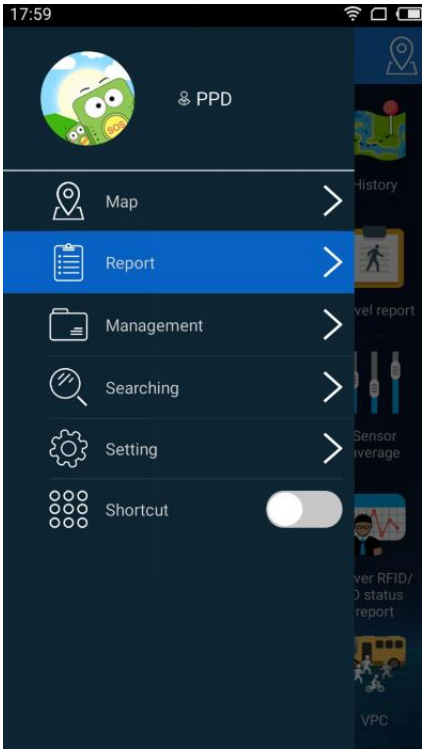


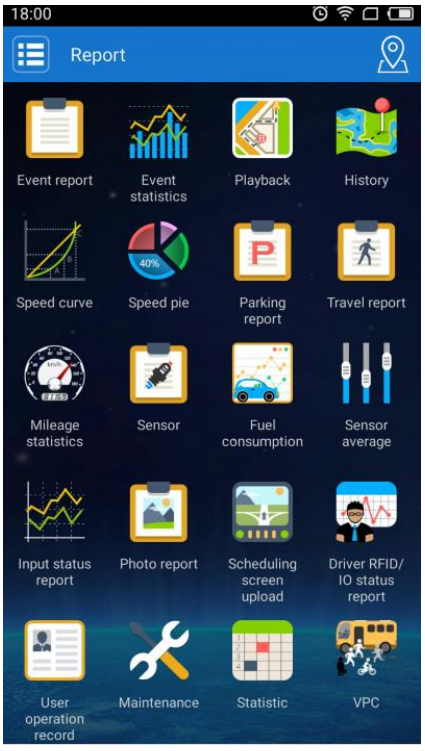




7.3 Querying Historical Data/Event Reports by MS03 App

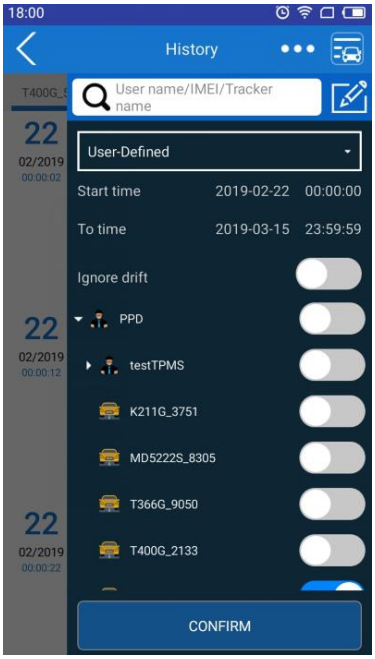
1. On the main interface, choose **Report** > **History** or **Report** > **Event report**.



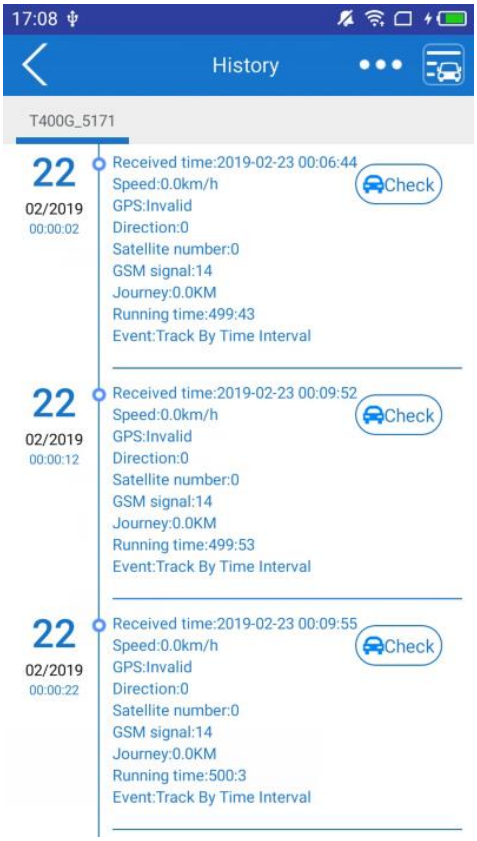


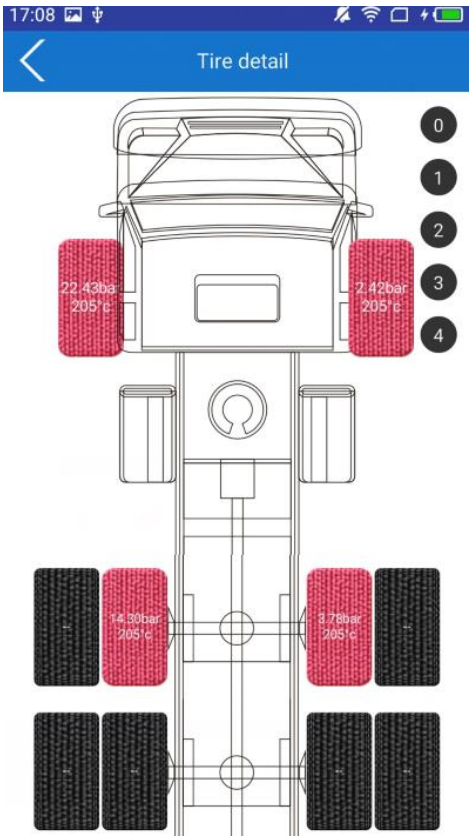
2. Set the time period to be queried and select an alert event. (The alert event option only exists on the **Event report**

interface.)



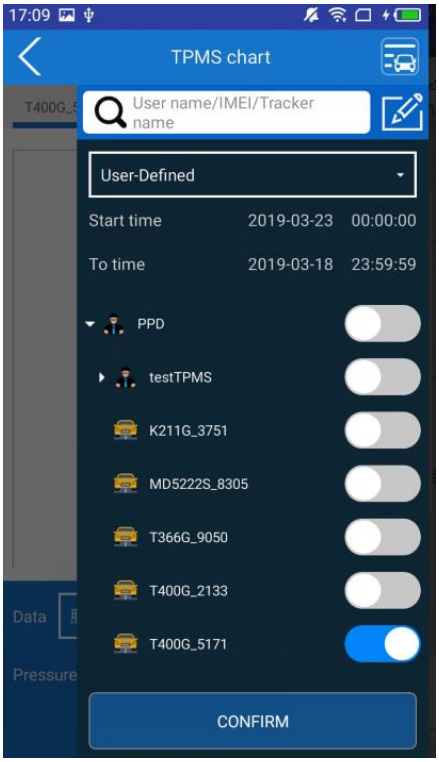
3. On the **History** page that is displayed, click **Check**. The **Tire detail** page will be displayed.



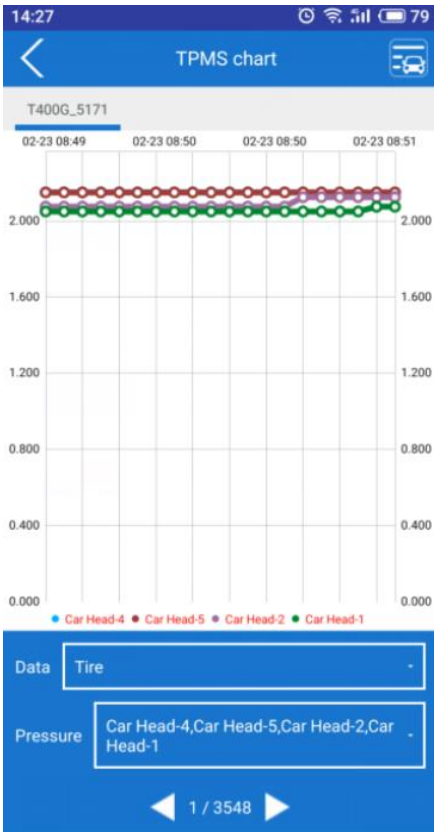


7.4 Querying Tire Pressure Reports by MS03 App

1. On the main interface, choose **Report** > **TPMS chart**. On the **TPMS chart** page that is displayed, set the time period to be queried.



2. To view tire pressure or temperature changes during a specific time period, set the data type (tire pressure or temperature) and select a tire, as shown in the following figure. (Note: There are 20 tire pressure values on each page of a tire pressure report.)



8 Querying Tire Pressure Data by LCD Display (Optional)

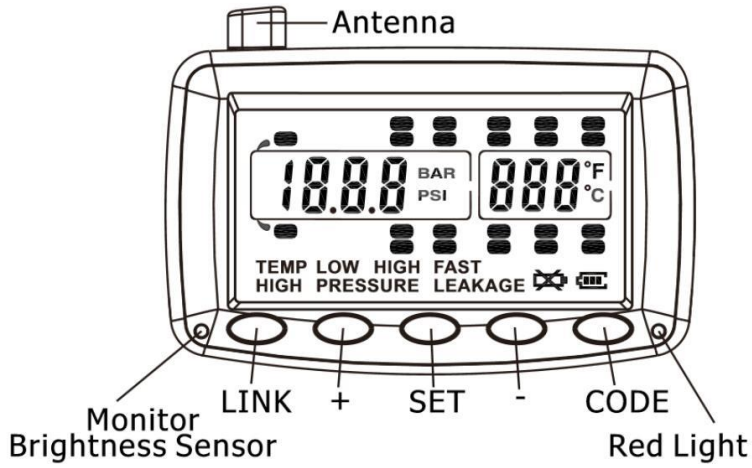
Besides the MS03 web platform and app, you can use the LCD display to receive tire pressure data after its coding is completed.

8.1 LCD Display Introduction

(1) The LCD display has an internal battery. It can also be supplied power with an external power supply.

(2) When the LCD display does not detect vibration for 10 consecutive minutes, it will enter the sleep mode automatically. This helps save battery power. When it detects vibration, it will be woken up and will start to receive data.

(3) LCD display appearance



(4) LCD display keys

No.	Key	Function Description
1	Power button	The key is on the left of the LCD display and used to power on or power off the LCD display.
2	LINK	Used to clear the ID numbers of configured tire pressure sensors.
3	SET	Used to confirm.
4	CODE	Used for code matching.
5	+ / -	Used to select a tire pressure sensor's ID number.

8.2 LCD Display Configuration

To determine which tire pressure data is showed on the LCD display, you need to set code matching.

8.2.1 Auto Code Matching

In standby mode, press and hold down the **CODE** key of the LCD display for 3 seconds. When you hear "Bi" once, release the key. Then the system will enter code matching mode and the icon of the tire requiring code matching will blink on the LCD display. Press the **+** or **-** key to select the tire's location, place the bottom of the LCD display close to the tire pressure sensor requiring code matching, and press the **CODE** key. The sensor will start to match a code. Then "IDLF" will be showed on the LCD display, and the red LED indicator will be steady on. If the LCD display receives

the 6-digit ID number of the sensor, the ID number will be showed on the LCD display and the red LED indicator will be off. When the buzzer makes a long sound "Bi", it means that code matching is performed successfully and the ID number will be stored automatically. If you do not receive the ID number within 6 seconds, you will hear "Bi" twice, the red LED indicator will be off, and "Id Err" will be showed on the LCD display, which indicates that code matching fails to be performed. Please rotate the direction of the sensor or LCD display, or place the bottom of the LCD display close to the sensor requiring code matching, and then press the **CODE** key to preform code matching again. Press the **+** key to select the next tire requiring code matching, and perform the same steps to complete code matching. If the codes are the same, the previous same ID number will be deleted automatically. After all the ID numbers are matched codes successfully, perform one of the following steps to exit the settings state or enter normal working status: (1) do not press any key for 3 consecutive minutes to exit the settings state; (2) press and hold down the **CODE** key for 3 seconds. After you hear "Bi" once, release the key. The LCD display will return to normal working status.

Code matching success: The ID number is showed after the corresponding tire is selected.
Code matching failed: "Id Err" is showed on the LCD display.

8.2.2 Manual Code Matching

In standby mode, press and hold down the **CODE** key of the LCD display for 6 seconds (continue to press the key when you hear the first "Bi" sound; release the key when you hear the second "Bi" sound). The system will enter manual code matching mode, and the ID number of the current tire will be showed on the LCD display. Press the **+** or **-** key to select the tire requiring code matching, and press the **SET** key to confirm. Then press the **CODE** key to switch the digits of the 6-digit ID number, press the **+** or **-** key to set the value of the ID number, and press the **SET** key to store. Press the **+** key to select the next tire requiring code matching, and perform the same steps to complete code matching. After all the ID numbers are matched codes successfully, perform one of the following steps to exit the settings state or enter normal working status: (1) do not press any key for 3 consecutive minutes to exit the settings state; (2) press and hold down the **CODE** key for 3 seconds. After you hear "Bi" once, release the key. The LCD display will return to normal working status.

8.2.3 Deleting ID numbers

Deleting an ID number in ID number querying mode:

In standby mode, short press the **CODE** key of the LCD display. When you hear "Bi" once, the system will enter ID number querying mode. Press the **+** or **-** key to select the location of the tire to be deleted, and press and hold down the **SET** key for 3 seconds. If you hear "Bi" twice, it means that the tire's ID number is deleted. In this way, perform one of the following steps to exit the settings state or enter normal working status: (1) do not press any key for 3 consecutive minutes to exit the settings state; (2) short press the **CODE** key. After you hear "Bi" once, release the key. The LCD display will return to normal working status.

Deleting an ID number in code matching mode:

In standby mode, press and hold down the **CODE** key of the LCD display for 3 seconds. When you hear "Bi" once, release the key. Then the system will enter code matching mode. Press the **+** or **-** key to select the location of the tire to be deleted, and press and hold down the **SET** key for 3 seconds. If you hear "Bi" twice, it means that the tire's ID number is deleted. In this way, perform one of the following steps to exit the settings state or enter normal working status: (1) do not press any key for 3 consecutive minutes to exit the settings state; (2) press and hold down the **CODE** key for 3 seconds. After you hear "Bi" once, release the key. The LCD display will return to normal working status.

Deleting all the ID numbers:

In standby mode, short press the **CODE** key of the LCD display. When you hear "Bi" once, the system will enter ID number querying mode. Then press and hold down the **LINK** key for 3 seconds. When you hear "Bi" once, release the key. Then "DEL ALL" will be showed on the LCD display, indicating that all tires' ID numbers will be deleted. Short press the **SET** key to confirm and delete all the ID numbers. Then the LCD display will make a long "Bi" sound for 3 seconds and will return to normal working status. If you short press the **CODE** key instead of the **SET** key, all the ID numbers will not be deleted and the LCD display will return to ID number querying mode. If you do not press any key for 3 consecutive minutes, the LCD display will return to normal working status.

8.2.4 Restoring Factory Settings

When the LCD display is turned off, press the **SET** key to turn on it. When you hear "Bi" once, release the key. Then default alert parameters will be restored, and original ID numbers of tires will remain unchanged.

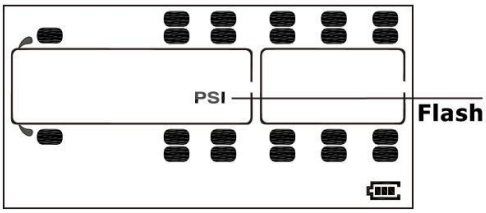
After factory settings are restored, related parameters are as follows:

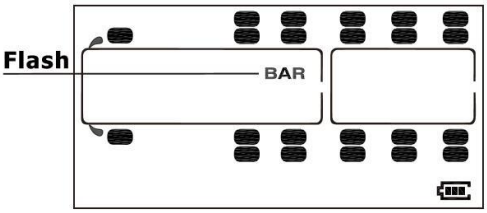
Pressure unit	PSI
High pressure alert threshold	175 PSI (12.1 BAR)
Low pressure alert threshold	100 PSI (6.9 BAR)
Temperature unit	°C
High temperature alert threshold	70°C (158 °F)

8.2.5 Setting Alert Thresholds

After the LCD display is turned on, long press the **SET** key. When you hear "Bi" once, release the key. Then you can set high temperature, low temperature, high pressure, and low pressure alert thresholds of vehicle's containers.

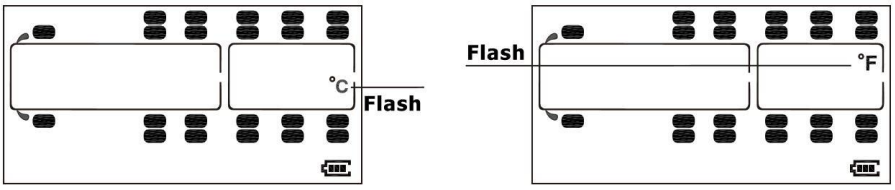
Pressure unit:





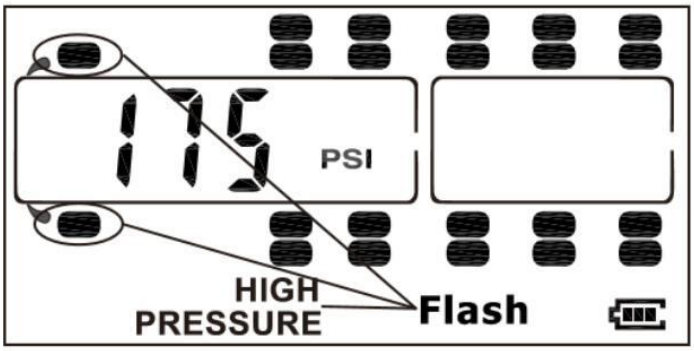
Press the + or - key to select a pressure unit.

Temperature unit:

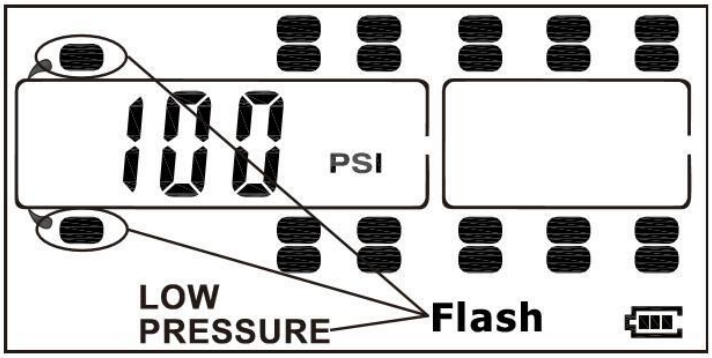


Press the **+** or **-** key to select a temperature unit.

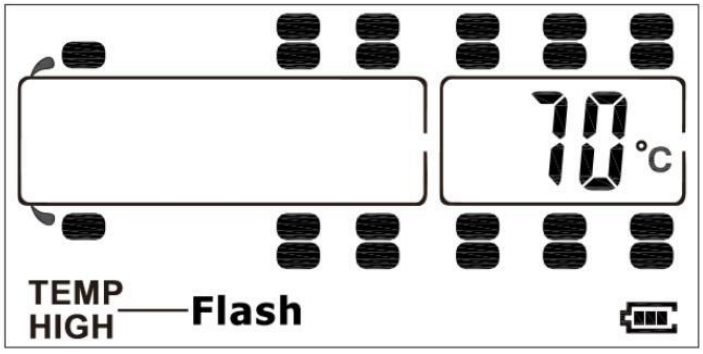
High pressure alert threshold:



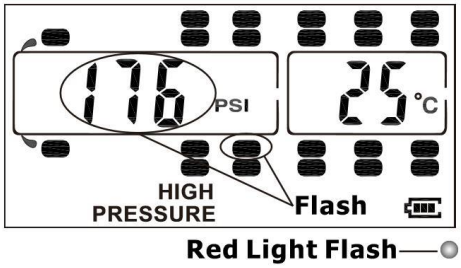
Low pressure alert threshold:



High temperature alert threshold:

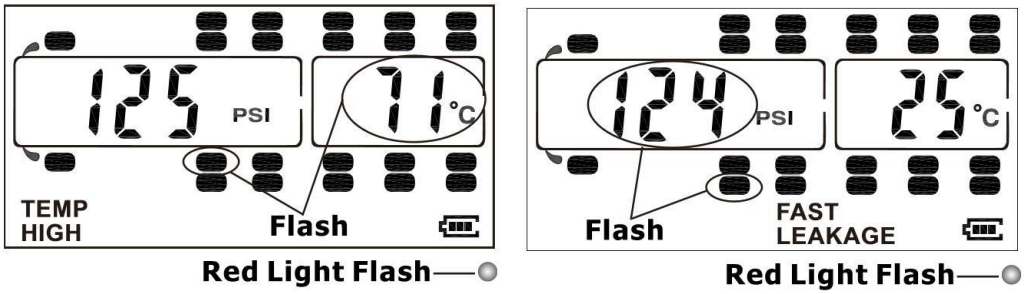


8.2.6 Viewing Alerts



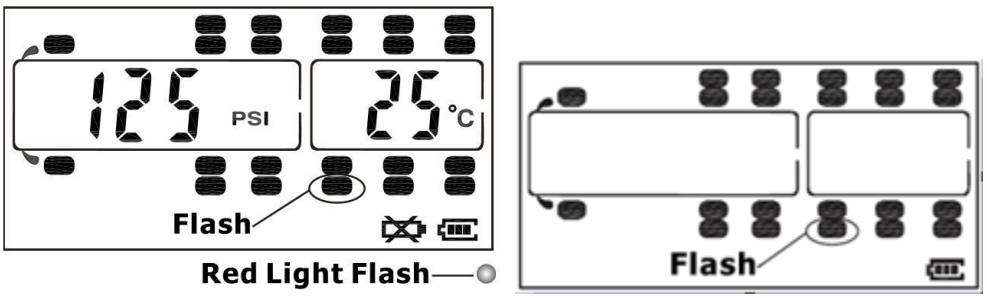
High pressure alert: The red LED indicator and corresponding tire icon will blink.

Low pressure alert: The red LED indicator and corresponding tire icon will blink.



High temperature alert: The red LED indicator and corresponding tire icon will blink.

Fast air leak alert: The red LED indicator and corresponding tire icon will blink.



Low battery alert for the sensor: The red LED indicator and corresponding tire icon will blink.

Data receiving failure alert: The corresponding tire icon will blink.

9 Tire Pressure Sensor GPRS Protocol

9.1 Tracker Command Format

$$<Data identifier><Data length>,<IMEI>,<Command type>,<Event code>,<(-)Latitude>,<(-)Longitude>,<Date and time>,<Positioning status>,<Number of satellites>,<GSM signal strength>,<Speed>,<Direction>,<Horizontal dilution of precision (HDOP)>,<Altitude>,<Mileage>,<Run time>,<Base station info>,<I/O port status>,<Analog input value><Geo-fence number>/<Additional event info>,<Customized data>,<Extended protocol version>,<Fuel percentage>,<Temperature sensor 1 value|Temperature sensor 2 value|……Temperature sensor n value>,<Data of tire pressure sensor 1|Data of tire pressure sensor 2|……Data of tire pressure sensor n><*Checksum >\r\n

Note:

- A comma (,) is used to separate data characters. The character type is the American Standard Code for Information Interchange (ASCII) (hexadecimal: 0x2C).
- Symbols "<" and ">" will not be present in actual data, only for documentation purpose only.
- All multi-byte data complies with the following rule: High bytes are prior to low bytes.
- The size of a GPRS data packet is about 160 bytes.

Descriptions about GPRS packets from the tracker are as follows:

Parameter	Description	Example
@@ / $$	@@: Indicates the GPRS data packet header sent from the server to the tracker. The header type is ASCII (hexadecimal: 0x40). $$: Indicates the GPRS data packet header sent from the tracker to the server. The header type is ASCII (hexadecimal: 0x24).	@@ / $$
Data identifier	Contains 1 byte. The type is the ASCII, and its value ranges from **0x41** to **0x7A**.	Q
Data length	Indicates the length of characters from the first comma (,) to \r\n. Decimal. $$<*Data identifier*><*Data length*>,<*IMEI*>,<*Command type*>,<*Command content*><*Checksum*>\r\n	25
IMEI	Indicates the tracker's IMEI number. The number type is ASCII. It has 15 digits generally.	353358017784062
Command type	Hexadecimal	AAA
Event Code	Decimal	1
Latitude (-)yy.dddddd	Unit: degree; decimal When a minus (-) exists, the tracker is in the southern hemisphere. When no minus (-) exists, the tracker is in the northern hemisphere. **yy** indicates the degree. **dddddd** indicates the decimal part.	22.756325 Indicates 22.756325°N. -23.256438 Indicates 23.256438°S.
Longitude (-)xxx.dddddd	Unit: degree; decimal When a minus (-) exists, the tracker is in the western hemisphere. When no minus (-) exists, the tracker is in the eastern hemisphere. **xxx** indicates the degree. **dddddd** indicates the decimal part.	114.752146 Indicates 114.752146°E. -114.821453 Indicates 114.821453°W.
Date and time yymmddHHMMSS	**yy** indicates year. **mm** indicates month. **dd** indicates day. **HH** indicates hour. **MM** indicates minute. **SS** indicates second.	091221102631 Indicates 21 December 2009, 10:26:31 am.

	Decimal	
Positioning status	Indicates the GPS signal status. **A** = Valid; **V** = Invalid	A The GPS is valid.
Number of satellites	Indicates the number of received GPS satellites. Decimal.	5 Five GPS satellites are received.
GSM signal strength	Value: 0–31; decimal	12 The signal strength is 12.
Speed	Unit: km/h; decimal	58 The speed is 58 km/h.
Direction	Indicates the driving direction. The unit is degree. When the value is **0**, the direction is due north. The value ranges from **0** to **359**. Decimal	45: The location is at northeast. 90: The location is at due east.
HDOP	The value ranges from **0.5** to **99.9**. The smaller the value is, the more the accuracy is. When the accuracy value is **0**, the signal is invalid. Decimal 0.5–1: Perfect 2–3: Wonderful 4–6: Good 7–8: Medium 9–20: Below average 21–99.9: Poor	5 The HDOP is 5.
Altitude	Unit: meter; decimal	118
Mileage	Unit: meter; decimal Indicates the total mileage. The maximum value is **4294967295**. If the value exceeds the maximum value, it will be automatically cleared.	564870
Run time	Unit: second; decimal Indicates the total time. The maximum value is **4294967295**. If the value exceeds the maximum value, it will be automatically cleared.	2546321
Base station info	The base station information includes: MCC|MNC|LAC|CI Note: Base station information in an SMS is empty. The MCC and MNC are decimal, while the LAC and CI are hexadecimal.	460|0|E166|A08B
I/O port status	Hexadecimal Status values of eight input ports and eight output ports: Bits 0–7 correspond to status of output ports 1–8. Bits 8–15 correspond to status of input ports 1–8.	0421 (hexadecimal) = 0000 0100 0010 0001

Analog input value		Analog input values are separated by "|". Hexadecimal AD1|AD2|AD3|Battery analog|External power analog Voltage formula of analog inputs (AD1, AD2, AD3, AD4, and AD5): AD/100	123|456|235|1456|222 (Hexadecimal)
Additional event info	System flag	Contains 4 bytes; hexadecimal Bit 0: Whether to modify the EEP2 parameter. When the value is **1**, the EEP2 parameter is modified. Bits 1–31: reserved. Only available by GPRS event code 35.	00000001 The EEP2 parameter is modified.
Customized data		Reserved A separator still exists.	
Extended protocol version		Extended protocol version Decimal	4 The extended protocol version is 4.
Fuel percentage		Contains 4 hexadecimal characters. Note: When the fuel level sensor type is **0**, the sensor is not connected and the value is empty.	0E2E The fuel percentage is 36.30%.
Temperature sensor No. + Temperature value		Contains 6 hexadecimal characters. The first two characters indicate the temperature sensor No. The last four characters indicate the temperature value (actual temperature x 100; including the integer and decimal parts; -327.67°C to +327.67°C).	011A09|021A15|06FB2E There are 3 temperature sensors. Temperature sensor 1: 66.65°C Temperature sensor 2: 66.77°C Temperature sensor 6: -12.34°C
Tire pressure sensor data		At most 64 tire pressure sensors are supported. Contains 18 hexadecimal characters. ● First two characters: indicates the installation location of a tire pressure sensor; 1 byte (2 characters). Bits 7–5: indicate the vehicle's head part or trailer. 000(B): vehicle's head part; 001(B): trailer 1; 010(B): trailer 2; 011(B): trailer 3; 100(B): trailer 4. Bits 4–0: indicate the tire number. For example, 00001(B), indicating the first tire. ● The 3rd to 10th characters: indicates a tire pressure sensor's ID number; 4 bytes (8 characters); unsigned. ● The 11th to 14th characters: indicates the tire pressure; 2 bytes (4 characters); formula:	0A0012345602587801| 0B0012345702587801| 0C0012345802587801 There are 3 tire pressure sensors. The first tire pressure sensor: ● 0A: The sensor is installed inside the 10th tire on the vehicle's head part. ● 00123456: The tire pressure sensor ID is 0x00123456 (hexadecimal). ● 0258: The tire

	obtained value x 0.025; unit: bar; unsigned. ● The 15th and 16th characters: indicates the tire temperature; 1 byte (2 characters); formula: obtained value – 50; unit: °C; unsigned. ● The 17th and 18th characters: indicates the tire status; 1 byte (2 characters); unsigned. Bit 7: indicates the battery voltage status of the transmitter. 0: normal voltage; 1: low voltage. Bit 6: Whether to receive data from the transmitter. When you do not receive data from the transmitter within 15 minutes, the parameter value will be reset to 1. Bit 5: reserved. Bit 4: When the value is 1, the air pressure is high. Bit 3: When the value is 1, the air pressure is low. Bit 2: indicates temperature status. 1: high temperature; 0: normal temperature. Bits 1–0: indicates the alert status. 00: no alert; 01: fast air leak alert; 10: slow air leak alert; 11: tire inflation alert.	pressure is 15 bar. 0258 (hexadecimal) = 600 (decimal) 600 x 0.025 = 15 ● 78: The tire temperature is 70°C. 78 (hexadecimal) = 120 (decimal) 120 - 50 = 70 ● 01: A fast air leak alert is generated. The second tire pressure sensor: ● 0B: The sensor is installed inside the 11th tire on the vehicle's head part. ● 00123457: The tire pressure sensor ID is 0x00123457 (hexadecimal). ● 0258: The tire pressure is 15 bar. 0258 (hexadecimal) = 600 (decimal) 600 x 0.025 = 15 ● 78: The tire temperature is 70°C. 78 (hexadecimal) = 120 (decimal) 120 - 50 = 70 ● 01: A fast air leak alert is generated. The third tire pressure sensor: ● 0C: The sensor is installed inside the 12th tire on the vehicle's head part. ● 00123458: The tire pressure sensor ID is 0x00123458 (hexadecimal). ● 0258: The tire

		pressure is 15 bar. 0258 (hexadecimal) = 600 (decimal) 600 x 0.025 = 15 ● 78: The tire temperature is 70°C. 78 (hexadecimal) = 120 (decimal) 120 - 50 = 70 ● 01: A fast air leak alert is generated.
*	Contains 1 byte. It is used to separate the command content from the checksum. ASCII (hexadecimal: 0x2A)	*
Checksum	Contains 2 bytes. Indicates the sum of characters from the packet header to the checksum (excluding the checksum and ending character). Hexadecimal $$<*Data identifier*><*Data length*>,<*IMEI*>,<*Command type*>,<*Command content*><*Checksum*>\r\n	BE
\r\n	Contains 2 bytes. The parameter is an ending character. The type is ASCII (hexadecimal: 0x0d,0x0a).	\r\n

9.2 Command Details

9.2.1 Obtaining All Alert Parameters of a Tire Pressure Sensor – DA0 (GPRS)

GPRS Sending	DA0
GPRS Reply	DA0,*<High pressure threshold of the first axle><Low pressure threshold of the first axle><High pressure threshold of the second axle><Low pressure threshold of the second axle><High pressure threshold of the third axle><Low pressure threshold of the third axle><High pressure threshold of the fourth axle><Low pressure threshold of the fourth axle><High pressure threshold of the trailer><Low pressure threshold of the trailer><High temperature threshold>*
Description	High pressure threshold of the first axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. Low pressure threshold of the first axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. High pressure threshold of the second axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar.

	Low pressure threshold of the second axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. High pressure threshold of the third axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. Low pressure threshold of the third axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. High pressure threshold of the fourth axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. Low pressure threshold of the fourth axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. High pressure threshold of the trailer: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. Low pressure threshold of the trailer: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. High temperature threshold: hexadecimal; unsigned; 1 byte; formula: obtained value – 50; unit: °C.
Example	
GPRS Sending	@@Q25,863835020877432,DA0*72\r\n
GPRS Reply	$$Q90,863835020877432,DA0,020800100000000000004576*46\r\n

9.2.2 Obtaining Data of All Bound Tire Pressure Sensors – DA1 (GPRS)

GPRS Sending	DA1
GPRS Reply	DA1,*<Location 1><ID1><Tire pressure 1><Temperature 1><Status 1>...<Location n><IDn><Tire pressure n><Temperature n><Status n>*
Description	● Location: indicates the installation location of a tire pressure sensor; 1 byte; unsigned; hexadecimal. Bits 7–5: indicate the vehicle's head part or trailer. 000(B): vehicle's head part; 001(B): trailer 1; 010(B): trailer 2; 011(B): trailer 3; 100(B): trailer 4. Bits 4–0: indicate the tire number. For example, 00001(B), indicating the first tire. ● ID: indicates a tire pressure sensor's ID number; 4 bytes; unsigned; hexadecimal. ● Tire pressure: 2 bytes; unsigned; hexadecimal; formula: obtained value x 0.025; unit: bar. ● Temperature: indicates the tire temperature; 1 byte; unsigned; hexadecimal; formula: obtained value – 50; unit: °C. ● Status: indicates the tire status; 1 byte; unsigned; hexadecimal. Bit 7: indicates the battery voltage status of the transmitter. 0: normal voltage; 1: low voltage. Bit 6: Whether to receive data from the transmitter. When you do not receive data from the transmitter within 15 minutes, the parameter value will be reset to 1. Bit 5: reserved. Bit 4: When the value is 1, the air pressure is high. Bit 3: When the value is 1, the air pressure is low.

	Bit 2: indicates temperature status. 1: high temperature; 0: normal temperature. Bits 1–0: indicates the alert status. 00: no alert; 01: fast air leak alert; 10: slow air leak alert; 11: tire inflation alert. Note: At most 64 tire pressure sensors are supported. In other words, the maximum value of *n* is 64.
Example	
GPRS Sending	@@Q25,863835020877432,DA1*82\r\n
GPRS Reply	$$Q90,863835020877432,DA1,020800100000000000000711010000000000000061001000000000000501010000000000000040001000000000000031100000000000000010185A000000BC*46\r\n

9.2.3 Obtaining Data of a Tire Pressure Sensor – DA2 (GPRS)

GPRS Sending	DA2,*Location*
GPRS Reply	DA2,*<Location><ID><Tire pressure><Temperature><Status>*
Description	● Location: indicates the installation location of a tire pressure sensor; 1 byte; unsigned; hexadecimal. Bits 7–5: indicate the vehicle's head part or trailer. 000(B): vehicle's head part; 001(B): trailer 1; 010(B): trailer 2; 011(B): trailer 3; 100(B): trailer 4. Bits 4–0: indicate the tire number. For example, 00001(B), indicating the first tire. ● ID: indicates a tire pressure sensor's ID number; 4 bytes; unsigned; hexadecimal. ● Tire pressure: 2 bytes; unsigned; hexadecimal; formula: obtained value x 0.025; unit: bar. ● Temperature: indicates the tire temperature; 1 byte; unsigned; hexadecimal; formula: obtained value – 50; unit: °C. ● Status: indicates the tire status; 1 byte; unsigned; hexadecimal. Bit 7: indicates the battery voltage status of the transmitter. 0: normal voltage; 1: low voltage. Bit 6: Whether to receive data from the transmitter. When you do not receive data from the transmitter within 15 minutes, the parameter value will be reset to 1. Bit 5: reserved. Bit 4: When the value is 1, the air pressure is high. Bit 3: When the value is 1, the air pressure is low. Bit 2: indicates temperature status. 1: high temperature; 0: normal temperature. Bits 1–0: indicates the alert status. 00: no alert; 01: fast air leak alert; 10: slow air leak alert; 11: tire inflation alert.
Example	
GPRS Sending	@@g27,863835020877432,DA2,01*C8\r\n
GPRS Reply	$$g35,863835020877432,DA2,010185R000000K@*F2\r\n

9.2.4 Deleting Tire Pressure Sensors – DA3 (GPRS)

GPRS Sending	DA3,*<Location 1>...<Location n>*

GPRS Reply	DA3,<*Location 1*>...<*Location n*>,OK
Description	Location: indicates the installation location of a tire pressure sensor; 1 byte; unsigned; hexadecimal. Bits 7–5: indicate the vehicle's head part or trailer. 000(B): vehicle's head part; 001(B): trailer 1; 010(B): trailer 2; 011(B): trailer 3; 100(B): trailer 4. Bits 4–0: indicate the tire number. For example, 00001(B), indicating the first tire. Note: 1. The maximum value of *n* is 64. 2. If the command is sent successfully, the installation locations of deleted tire pressure sensors will be received.
Example	
GPRS Sending	@@i27,863835020877432,DA3,0A*22\r\n
GPRS Reply	$$i34,863835020877432,DA3,0A,OK*56\r\n

9.2.5 Obtaining Data of Multiple Tire Pressure Sensors – DA4 (GPRS)

GPRS Sending	DA4,<*Location 1*><*ID1*>...<*Location n*><*IDn*>
GPRS Reply	DA4,<*Location 1*><*ID1*>...<*Location n*><*IDn*>,OK
Description	● Location: indicates the installation location of a tire pressure sensor; 1 byte; unsigned; hexadecimal. Bits 7–5: indicate the vehicle's head part or trailer. 000(B): vehicle's head part; 001(B): trailer 1; 010(B): trailer 2; 011(B): trailer 3; 100(B): trailer 4. Bits 4–0: indicate the tire number. For example, 00001(B), indicating the first tire. ● ID: indicates a tire pressure sensor's ID number; 4 bytes; unsigned; hexadecimal. Note: 1. At most 64 tire pressure sensors are supported. In other words, the maximum value of *n* is 64. 2. If the command is sent successfully, the installation locations and ID numbers of bound tire pressure sensors will be received.
Example	
GPRS Sending	@@\31,863835020877432,DA4,9800100100*62\r\n
GPRS Reply	$$\59,863835020877432,DA4,0210000000!0100000800100100C11000000980010010 0010185R00,OK*A4\r\n

9.2.6 Setting Alert Thresholds of a Tire Pressure Sensor – DA5 (GPRS)

GPRS Sending	DA5,<*High pressure threshold of the first axle*><*Low pressure threshold of the first axle*><*High pressure threshold of the second axle*><*Low pressure threshold of the second axle*><*High pressure threshold of the third axle*><*Low pressure threshold of the third axle*><*High pressure threshold of the fourth axle*><*Low pressure threshold of the fourth axle*><*High pressure threshold of the trailer*><*Low pressure threshold of the trailer*><*High temperature threshold*>
GPRS Reply	DA5,OK

Description	High pressure threshold of the first axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. Low pressure threshold of the first axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. High pressure threshold of the second axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. Low pressure threshold of the second axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. High pressure threshold of the third axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. Low pressure threshold of the third axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. High pressure threshold of the fourth axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. Low pressure threshold of the fourth axle: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. High pressure threshold of the trailer: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. Low pressure threshold of the trailer: hexadecimal; unsigned; 1 byte; formula: obtained value/10; unit: bar. High temperature threshold: hexadecimal; unsigned; 1 byte; formula: obtained value – 50; unit: °C.
Example	
GPRS Sending	@@l37,863835020877432,DA5,FF0000FFFFFF00000F19d*58\r\n
GPRS Reply	$$l31,863835020877432,DA5,OK*BC\r\n

If you have any questions, do not hesitate to email us at info@meitrack.com.