Copyright Information

Copyright © 2024 by SHENZHEN SMARTSAFE TECH CO.,LTD. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of SMARTSAFE.

Neither SMARTSAFE nor its affiliates shall be liable to the purchaser of this unit or third parties for damages, losses, costs, or expenses incurred by purchaser or third parties as a result of: Accident, misuse, or abuse of this unit, or unauthorized modifications, repairs, or alterations to this unit, or failure to strictly comply with SMARTSAFE operating and maintenance instructions. SMARTSAFE shall not be liable for any damages or problems arising from the use of any options or any consumable products other than those designated as Original SMARTSAFE Products or SMARTSAFE Approved Products by SMARTSAFE.

All information, specifications and illustrations in this manual are based on the latest information available at the time of printing. SMARTSAFE reserves the right to make changes at any time without prior written or oral notice.

Trademark Information

SmartSafe is a registered trademark of SHENZHEN SMARTSAFE TECH CO.,LTD. in China and other countries. All other SMARTSAFE trademarks, service marks, domain names, logos, and company names referred to in this manual are either trademarks, registered trademarks, service marks, domain names, logos, company names of SMARTSAFE or are otherwise the property of SMARTSAFE or its affiliates. In countries where any of the SMARTSAFE trademarks, service marks, domain names, logos and company names are not registered, SMARTSAFE claims other rights associated with unregistered trademarks, service marks, domain names, logos, and company names. Other products or company names referred to in this manual may be trademarks of their respective owners. You may not use any trademark, service mark, domain name, logo, or company name of SMARTSAFE or any third party without permission from the owner of the applicable trademark, service mark, domain name, logo, or company name. You may contact SMARTSAFE by visiting the website at www.newsmartsafe.com, or writing to SHENZHEN SMARTSAFE TECH CO.,LTD., 3310, Building 11, Tianan Cloud Park, Bantian Street, Longgang District, Shenzhen, Guangdong, China, to request written permission to use Materials on this manual for purposes or for all other questions relating to this manual.

Safety Warnings

Please read all safety warnings and operating information carefully. To avoid personal injury, property loss or accidental damage to the product caused by improper operation, please pay attention to the following points when using this product:

- Always conduct vehicle detection in a safe environment.
- Never operate the detection device while driving a vehicle to avoid distraction and thus cause a car accident.
- Before starting the engine, the handbrake should be pulled, especially the front wheel should be protected, and the gear shift lever should be placed in **Neutral** (manual transmission) or **P** gear (automatic transmission), so as to avoid starting the engine and causing the vehicle to rush out and hurt people.
- The exhaust gas from the engine contains a variety of toxic compounds (such as hydrocarbons, carbon monoxide, nitrogen oxides, etc.), which can cause slow reaction and even serious personal injury or death. The vehicle under test should be parked in a well-ventilated place during operation.
- Use extreme caution when working around ignition coils, distributor caps, ignition lines and ignition plugs. These components generate dangerous voltages when the engine is running.
- Do not look directly at the laser beam of the device, and it is recommended to wear ANSI compliant goggles.
- Keep safety tips and warning labels on the device clean and legible.
- Keep the detection device dry and clean, away from gasoline, water and grease. If necessary, clean the surface of the device with a clean cloth coated with a mild detergent.
- Use only authorized and qualified parts for device repair and maintenance.
- All internal maintenance of the detection device must be carried out by an authorized maintenance organization or authorized technicians. Attempts to disassemble or modify the device will void the warranty.
- The safety information described herein covers all situations of which our company is aware. We cannot know, predict, or recommend all possible hazards. The operator must ensure that the maintenance operation performed under any circumstances will not cause harm to personal safety.

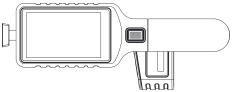
Table of Contents

1. Packing List **1**
2. Product Introduction **2**
2.1 Overview 2
2.2 TTM313 Main Unit 2
2.3 Technical Parameters 3
3. First Use **4**
3.1 Charging 4
3.2 Power On 4
3.3 Main Interface 5
3.4 Precautions 5
3.5 Measurement Value Description 5
4. Full Tread **6**
4.1 Measurement Methods and Readings 6
4.2 Measurement Steps 8
5. Single Tread **11**
5.1 Measurement Methods and Readings 11
5.2 Measurement Steps 13
6. Detection **16**
7. Calibration **17**
8. Settings **18**
8.1 Network Connection 18
8.2 Bluetooth 18
8.3 Brightness Adjustment 19
8.4 One-click Upgrade 19
8.5 Sleep Mode 19
8.6 Automatic Power Off 19
8.7 Language Settings 20
8.8 Restore Factory Settings 20
8.9 About 20
9. Report **21**

9.1 Report Management 21
9.2 Report Viewing and Sharing 21
Warranty 23

1. Packing List

The following product configuration list is for reference only. For details, please consult the local dealer or check the accompanying packing list.

No.	Name	Picture for Reference	Quantity
1	Main unit		1
2	Power Adaptor		1
3	USB cable (Type-C)		1
4	Calibration platform		1
5	User manual	-	1
6	Packing list	-	1

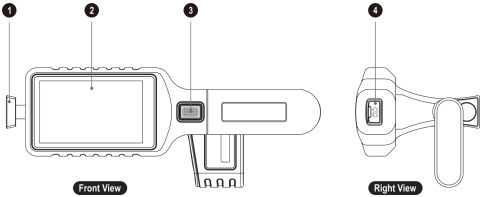
2. Product Introduction

2.1 Overview

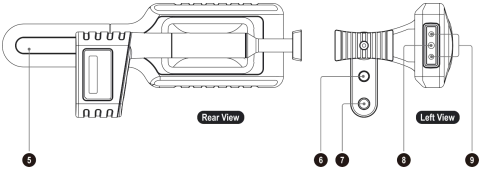
The TTM313 handheld tire tread detection equipment is a device developed by SmartSafe for detecting vehicle tire tread and analyzing wear conditions. The device supports two functional modes: full tread detection and single groove detection, accurately and quickly assessing tire wear conditions. This tool can be used independently or in conjunction with detection equipment to view and print detailed tread detection reports.

Warning: This tool is a Class II laser product. Avoid direct eye exposure to the laser. Failure to follow the warning may result in serious injury.

2.2 TTM313 Main Unit



1- Magnetic Head **2-** Touch Screen **3-** Power Button/Function Button
4- Type-C Charging Port



5- Handle **6-** Camera Window **7-** Laser Window **8-** Camera **9-** Flashlight

2.3 Technical Parameters

No.	Parameter Item	Parameter Description
1	Processor	RK3326-s
2	Memory	2G
3	Storage	32G
4	Screen	3.97-inch LCD touch screen, resolution 480*800
5	Battery	5000mAh / 3.7V
6	Measuring Camera	2 million pixels
7	Photography Camera	8 million pixels
8	Measurement Accuracy	0.1 mm
9	Maximum Measurement Width	180 mm
10	Communication Methods	2.4GHz/5GHz dual-band Wi-Fi
		Bluetooth
11	Charging/Data Interface	Type-C
12	Charging Input	DC 5V/2A
13	Operating Temperature	0 ~ 45℃
14	Storage Temperature	-20 ~ 60℃

3. First Use

3.1 Charging

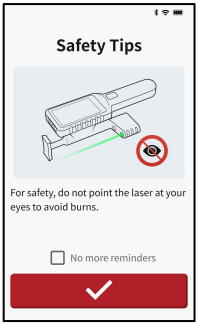
Connect one end of the USB cable (Type-C) to the power adaptor and the other end to the Type-C charging port of the main unit, then plug the power adaptor into the power outlet to charge the main unit. The battery icon on the main unit's screen shows as indicating that it is charging; when the battery icon shows as , it indicates that charging is complete.

3.2 Power On

3.2.1 Power On

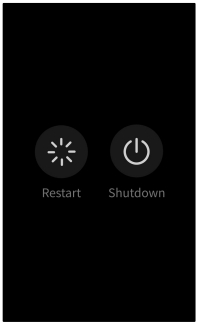
Press and hold the power button on the detection equipment until the screen lights up. The detection equipment will enter the boot screen, and then proceed to the safety warning page. Click the button to go to the main interface.

*Note: Select the checkbox before **"No more reminders"** and then click the button. The next time you turn the power on, you can skip this prompt page and go directly to the main interface.*



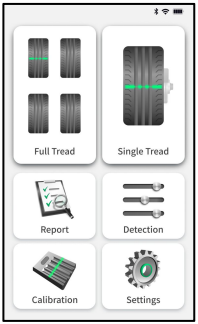
3.2.2 Shutdown

Press and hold the power button on the detection equipment until the screen pops up with the **"Restart/Shutdown"** options, allowing the user to choose to shutdown or restart the system.



3.3 Main Interface

The main interface of the TTM313 main unit includes functional modules such as **Full Tread, Single Tread**, **Report**, **Detection**, **Calibration**, and **Settings**.



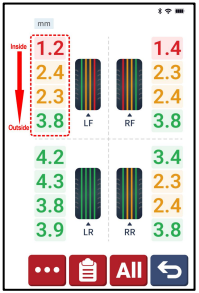
Functional Modules	Function Description
Full Tread	Used for sequentially detecting all tires of the vehicle.
Single Tread	Used for detecting a single tire of a vehicle.
Report	Used for querying and sharing the tire tread detection report.
Detection	Used for setting detection parameters.
Calibration	Used for the calibration of the detection instrument.
Settings	Used for system settings, updates, and restoring factory settings, etc.

3.4 Precautions

- Avoid using the handheld tire tread detection equipment in direct sunlight or other strong light environments to prevent affecting measurement accuracy.
- When using the handheld tire tread detection equipment for full tire tread detection, the detection equipment screen must be facing towards the outside of the vehicle tire or yourself.

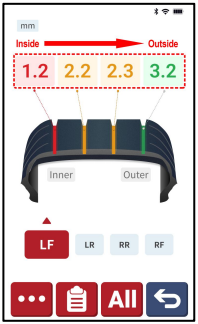
3.5 Measurement Value Description

The measurement values of the all tires scan correspond from **"inside → outside"**, and the values of each groove are displayed from **"top → bottom"**, as shown in the figure below:



The measurement values of the single tire detection correspond

from **"outside → inside"**, and the values of each groove are displayed from **"left → right"**, as shown in the figure below:



Display Item	Description
Green Groove	Indicates that the wear level of the groove is within the normal range, with a depth greater than or equal to the safe value.
Yellow Groove	Indicates that the wear level of the groove is within the warning range, with a depth greater than the safe value but less than the normal value. It is recommended to replace the tires.
Red Groove	Indicates that the groove is severely worn, with a depth less than or equal to the danger value, and the tire needs to be replaced immediately.
Groove Depth Value	Displays the depth values of each groove of the tire.

4. Full Tread

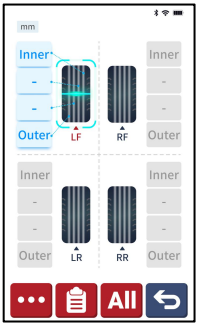
The full tread can sequentially detect all tires of 4-tire or 6-tire passenger vehicles, supporting two detection modes: all tread mode and single groove mode.

4.1 Measurement Methods and Readings

Click All / Single button on the **Full Tread** interface to switch detection modes, which include all tread mode and single groove mode.

4.1.1 All Tread Mode

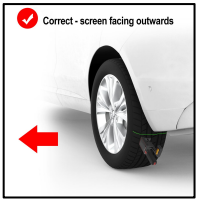
All tread mode supports scanning multiple grooves at a time, and can obtain the depth data of all the main grooves of the tire at one time.



1. When conducting detection in all tread mode, the magnetic head

of the detection equipment should be attached to the center of the corresponding tire tread, and care should be taken to avoid the laser line of the detection equipment being projected onto the secondary grooves. Refer to the diagram below for the correct and incorrect measurement methods.

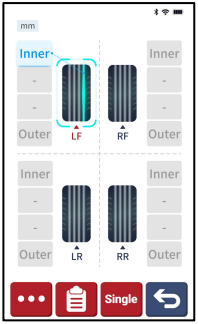
2. When conducting detection in all tread mode, the screen of the detection equipment must be facing the outside of the vehicle, as shown in the figure below.



3. When conducting detection in all tread mode, press the function button on the detection equipment, and the system will default to recording the detection results of all main grooves of the tire at once.

4.1.2 Single Groove Mode

Single groove mode supports independent detection of a single groove, allowing for the sequential acquisition of the depth of each individual tire groove.

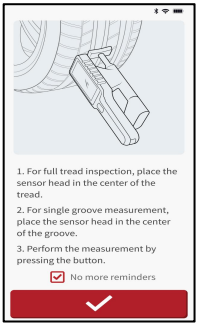


When conducting detection in single groove mode, the magnetic head of the detection equipment must be attached to the center of the groove, and then press the function button on the detection equipment to take measurements.

4.2 Measurement Steps

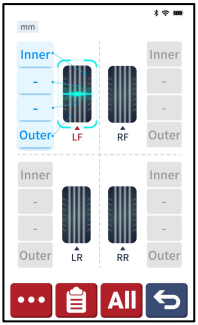
The detection steps for all tread mode and single groove mode are basically the same. Below, we will introduce the specific steps for all tires scanning using all tread mode as an example.

1. Click on the **"Full Tread"** function module on the main interface to enter the operation prompt interface.

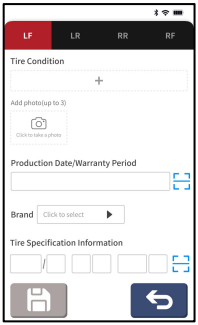


2. Read the detection method prompted on the screen, and then click the ✓ button to enter the detection interface.

*Note: Select the checkbox before **"No more reminders"**, and then click the ✓ button to skip this prompt page during the next detection.*



3. Click the button to enter the more detection options interface, where you can input tire status (photo), production date/warranty period (photographic identification or manual input), brand, tire specifications (photographic identification or manual input), etc.
After the information entry is completed, click the button to save the entered tire information.

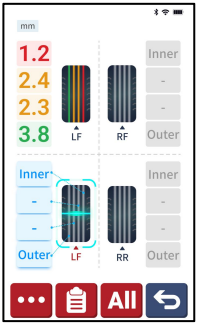


4. The system defaults to detecting from the front left wheel of the vehicle, but you can also manually select any tire for detection. After clicking the tire icon, attach the magnetic head of the detection equipment to the center of the tread of the corresponding tire, and then press the function button on the detection equipment to start the detection. At this time, the icon corresponding to the current tire shows a scanning animation, while the laser window of the detection equipment emits a green laser.

*Note: The system defaults to a 4-tire detection mode. If you need to switch to a 6-tire detection mode, you can click **"Detection"** on the main interface and then modify the number of tires.*

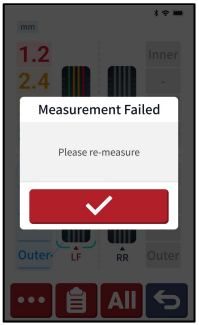
5. After completing the current tire

detection, the scanning cursor will automatically jump to the next tire icon in a counterclockwise direction.



6. After completing the detection of all tires in sequence, the tire icon will be marked in different colors to indicate the detection results of the tire grooves.

If a detection failure occurs, a pop-up will appear on the screen indicating measurement failed. Please confirm that the magnetic head of the detection equipment is in contact with the tire tread, and then press the function button again to re-measure.



7. After completing the detection of all tires, click the button to view and save the current detection report.
For more details on viewing and managing detection reports, refer to **Chapter 9 Report**.

8. Click the button to exit the current measurement process and return to the main interface.

Note: Exiting the measurement process will clear the current measurement data. Please save the current measurement data as a detection report in a timely manner.

5. Single Tread

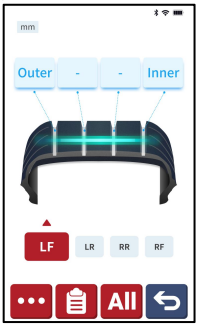
Single tread supports the selection of a single tire for detection on 4-tire or 6-tire passenger vehicles. It supports two detection methods: all tread mode and single groove mode.

5.1 Measurement Methods and Readings

Click All / Single button on the **Single Tread** interface to switch the detection mode, which includes two detection modes: all tread mode and single groove mode.

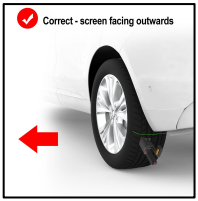
5.1.1 All Tread Mode

All tread mode supports scanning multiple grooves at a time, and can obtain the depth data of all the main grooves of the tire at one time.

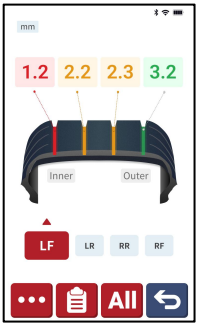


1. When conducting detection in all tread mode, the magnetic head of the detection equipment should be attached to the center of the corresponding tire tread, and care should be taken to avoid the laser line of the detection equipment being projected onto the secondary grooves. Refer to the diagram below for the correct and incorrect measurement methods.

2. When conducting detection in all tread mode, the screen of the detection equipment must be facing the outside of the vehicle tire, as shown in the figure below.

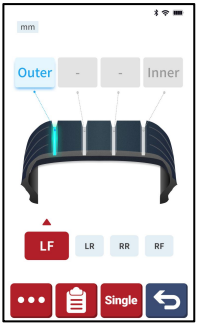


3. When conducting detection in all tread mode, press the function button on the detection equipment, and the system will default to recording the detection results of all main grooves of the tire at once.



5.1.2 Single Groove Mode

Single groove mode supports independent detection of a single groove, allowing for the sequential acquisition of the depth of each individual tire groove.

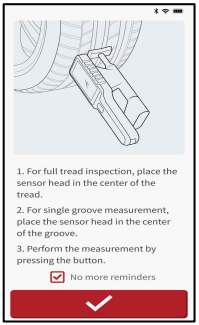


When conducting detection in single groove mode, the magnetic head of the detection equipment must be attached to the center of the groove, and then press the function button on the detection equipment to take measurements.

5.2 Measurement Steps

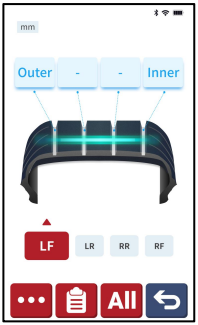
The detection steps for all tread mode and single groove mode are basically the same. Below, we will introduce the specific steps for single tire detection using all tread mode as an example.

1. Click the "**Single Tread"** function module on the main interface to enter the operation prompt interface.

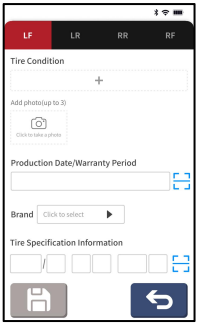


2. Read the detection method prompted on the screen, and then click the ✓ button to enter the detection interface.

*Note: Select the checkbox before "**No more reminders**", and then click the ✓ button to skip this prompt page during the next detection.*



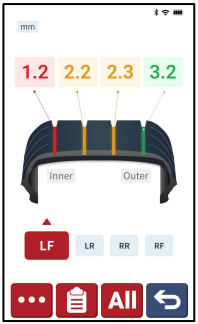
3. Click the button to enter the more detection options interface, where you can input tire status (take photo), production date/warranty period (photographic identification or manual input), brand, tire specifications (photographic identification or manual input), etc.
   After the information entry is completed, click the button to save the entered tire information.



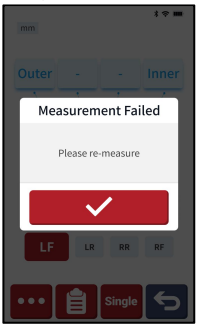
4. Click the tire name under the tire icon to select any tire for detection. After selecting the tire, attach the magnetic head of the detection equipment to the center of the tire tread, and then press the function button on the detection equipment to start the detection. At this time, the tire icon shows a scanning animation, while the laser window of the detection equipment emits a green laser.

   *Note: The system defaults to a 4-tire detection mode. If you need to switch to a 6-tire detection mode, you can click "**Detection**" on the main interface and then modify the number of tires.*

5. After completing the detection of a single tire, the tire icon will be marked in different colors to indicate the detection results of the tire grooves.



If a detection failure occurs, a pop-up will appear on the screen indicating measurement failed. Please confirm that the magnetic head of the detection equipment is in contact with the tire tread, and then press the function button again to re-measure.



6. Users can choose other tires to continue detection, or they can end the detection and click the button to view and save the single tire detection report.

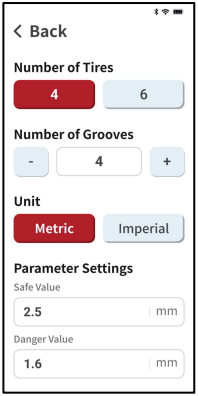
For more details on viewing and managing detection reports, refer to **Chapter 9 Report**.

7. Click the button to exit the current measurement process and return to the main interface.

Note: Exiting the measurement process will clear the current measurement data. Please save the current measurement data as a detection report in a timely manner.

6. Detection

Click "**Detection"** on the main interface to enter the following interface:



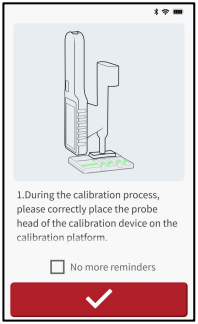
Setting item	Description
Number of tires	Switch the detection mode to 4-tire or 6-tire based on the number of tires of the vehicle to be detected, and click the corresponding value.
Number of grooves	Adjust the number of grooves based on the number of grooves that need to be independently detected for the tire.
Unit	Switch the display unit of the detection results to metric or imperial according to the requirements.
Parameter settings	Set safety values and danger values as needed.

7. Calibration

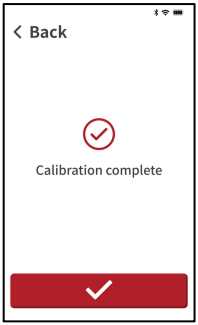
This function is used to perform calibration of the detection equipment.

1. Click "**Calibration"** on the main interface, and follow the on-screen prompts to correctly place the detection equipment on the calibrator, ensuring that the detection equipment's magnetic head is attached to the magnetic suction area on the calibrator.

   *Note: Select the checkbox before "**No more reminders"**, and then click the button to skip this prompt page during the next equipment calibration.*



2. Press the function button on the detection equipment to start the calibration.

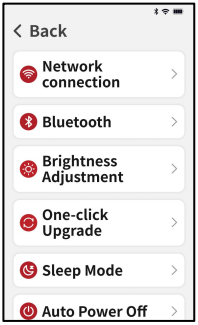


3. After calibration is complete, click the button to return to the system main interface.

   Note: If calibration fails, please adjust and ensure that the detection equipment's magnetic head is correctly placed on the calibrator, then click the button to execute the calibration step again.

8. Settings

Click "**Settings"** on the main interface to enter the following interface. Swipe up on the screen to see more setting options.



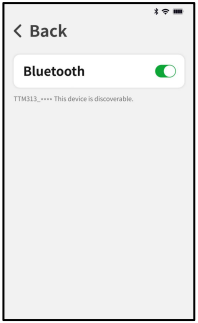
8.1 Network Connection

This function is used to connect to a wireless network. Please follow the steps below to set it up:

In the settings interface, click "**Network Connection" ,** then click the **WLAN** button, and the user can select the network they want to connect to. If the network name is displayed in red and is followed by **"√" ,** it indicates that the connection has been successfully established.

8.2 Bluetooth

This function is used to set up Bluetooth communication connection. In the settings interface, click "**Bluetooth" ,** then turn on the Bluetooth switch, and the detection equipment can be paired with other detection device for data transmission.



8.3 Brightness Adjustment

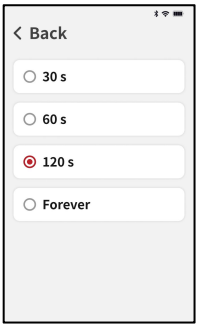
This function is used to adjust screen brightness.

8.4 One-click Upgrade

This function is used for equipment version upgrade.

8.5 Sleep Mode

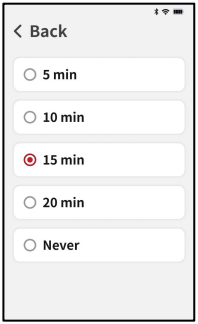
This function is used to set the waiting time for starting the system sleep mode.



8.6 Automatic Power Off

This function is used to set the waiting time for the detection equipment to automatically power

off.

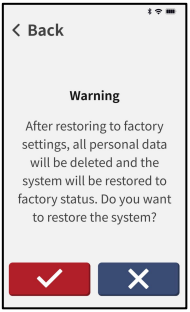


8.7 Language Settings

This function is used to switch system language.

8.8 Restore Factory Settings

This function is used to initialize the detection equipment. Restoring the factory settings will delete all personal data. Please proceed with caution.

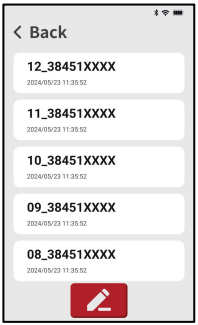


8.9 About

This function is used to view equipment model, product serial number, system version, application version, and database version.

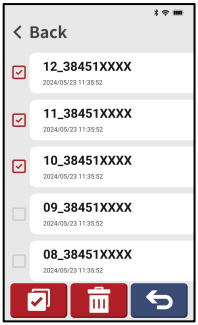
9. Report

This functional module is used to view and share detection reports. Click "**Report"** on the main interface to view the list of historical detection reports.



9.1 Report Management

Click the button at the bottom of the screen, then select the checkbox in front of the report or click the button to select all reports, and then click the button to delete the selected reports.

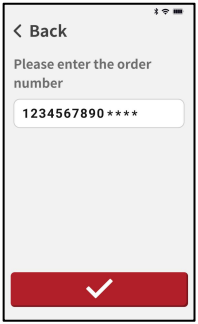


9.2 Report Viewing and Sharing

Clicking a single detection report in the detection report list will open the details of that report.
Swipe up and down on the screen to view more information about the detection report.

Display Item	Description
Tread depth data	Displays the tread data for each tire, including the depth values of each groove. Green indicates normal depth, yellow indicates warning depth, and red indicates danger depth.
Braking distance	Predicts the braking distance of a vehicle under limited road conditions and speed, and compare it with the ideal braking distance.
Tire wear	Displays the current wear condition of the vehicle tire being detected.
Repair recommendations	Based on the current vehicle detection data, provide maintenance suggestions on whether tire replacement and four-wheel alignment are necessary.
More	Displays the tire status of each tire of the currently detected vehicle, including tire identification code, brand, and tire specifications, etc.

Click the button at the bottom of the screen, then enter the order number and click the button to upload the report and generate a QR code.



Scan the QR code to share the detection report. In the online detection report obtained by scanning the QR code, the license plate number and mileage can be manually entered.

Warranty

This WARRANTY applies only to customers and dealers who have purchased SmartSafe products through normal procedures.

Within one year from the date of delivery, SmartSafe Company shall guarantee the defects of its electronic products caused by materials or processes. Damage of the equipment or components caused by abuse, unauthorized modification, use for purposes other than the design of the product, or failure to operate in the way specified in the instruction shall not be covered by this warranty.

Disclaimer

The warranty mentioned above may supersede any other warranty.

Order notification

The replaceable parts and optional parts can be ordered directly from the dealers authorized by SmartSafe. Please specify when ordering:

- Quantity ordered
- Part number
- Part name

Customer Service Center

If the equipment needs to be repaired, please send the equipment to SmartSafe, together with the purchase invoice and problem description. If the equipment is within the scope of the warranty, SmartSafe offer free maintenance; If the equipment is outside the scope of the warranty, SmartSafe will charge for maintenance and return freight.

Address of SmartSafe Company：
3310, Building 11, Tianan Cloud Park, Bantian Street, Longgang District, Shenzhen, Guangdong, China. Postcode: 518110

Statement: The Company reserves the right to change the product design and specifications without prior notice. The appearance and color of the object may be different from that shown in the instruction manual. The object shall prevail. We have tried our best to make all the descriptions in the book accurate, but there are still some inaccuracies. If you have any doubt, please contact the distributor or after-sales service center. The company will not assume any consequences caused by misunderstanding.

FCC Caution:

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception,

which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different

from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

Specific Absorption Rate (SAR) information

This device meets the government's requirements for FCC exposure limits set forth for an uncontrolled environment. This device was tested for typical body worn operations with the back of the Handheld tire tread detection equipment kept 0 mm from the body. To maintain compliance with FCC RF exposure requirements, use accessories that maintain an 0 mm separation distance between the user's body and the back of the Handheld tire tread detection equipment. The use of belt clips, holsters and similar accessories should not contain metallic components in its assembly. The use of accessories that do not satisfy these requirements may not comply with FCC RF exposure requirements, and should be avoided.