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To avoid personal injury, property damage, or accidental damage to the product, please read all the information in this chapter before using the product.

⚠ Operation Specification For New Energy Vehicle Safety Maintenance

1. Identification of high voltage components: The orange wiring harnesses of the vehicle are all high voltage wires.

2. High voltage parts: power battery pack, high voltage distribution box, on-board charger, driving motor controller and DC-DC assembly, electric power assembly, integrated compressor, PTC heater, maintenance switch.

3. When repairing the high voltage system, the power supply of the vehicle must be OFF (and the vehicle is in the non-charging state), and remove the maintenance switch; After the emergency maintenance switch is removed, it shall be kept by full-time guardianship personnel, and ensure that no one will plug it in

during the maintenance process.

⚠ *Notice: When the high voltage distribution box needs to be repaired or replaced, remove the positive and negative high voltage connectors connected to the battery pack carefully, and wrap the exposed wires with electrical tape to avoid electric shock.*

4. Five minutes after turning off the emergency maintenance switch, use a multimeter to measure the high voltage circuit and ensure that there is no power before checking and repairing the high voltage system.

4.1 Measure the voltage between the positive electrode of the battery pack and the body to preliminarily determine whether there is electric leakage. If the voltage is greater than or equal to 50V, it indicates that there is a leakage in the battery pack. Stop the operation immediately.

4.2 When using a multimeter to measure high voltage, select the correct measurement range. The accuracy level of the multimeter should not be lower than 0.5, and the measurement range should not be less than or equal to 600V. Please follow "One-hand Operation" principle;

4.3 One pen line of the multimeter is equipped with an insulated alligator clip (the voltage is required to be 3KV; the overcurrent capacity is greater than 5A). During measuring, clamp the clip to a terminal of the circuit first, and then connect the other pen to the terminal to measure the reading. Only hold the pen with one hand during each measurement; do not touch the metal part of the pen during measurement.

5. The maintenance switch shall not be assembled during low-voltage debugging. In high-voltage debugging, the full-time guardian shall instruct the assembly and maintenance switch.

6. High voltage debugging must be carried out under the premise

of good low voltage debugging, so as to determine whether the battery has leakage. If there is leakage, it should be checked in time, and high voltage debugging cannot be carried out.

7. During disassembling and installing the power battery pack assembly; wrap the high-voltage wiring harness connector connected to the high-voltage distribution box with insulation tape. Do not damage the wiring harness during disassembly and installation to avoid electric shock.

8. During repairing or replacing parts that pass through the sheet metal holes of the body, such as high-pressure wiring harnesses and tubing, pay attention to check whether the protection with the sheet metal of the body is normal to avoid the wear of the wiring harnesses and tubing.

⚠ NOTES

1. Maintain a safe environment for vehicle testing at all times.

2. Do not operate the detection equipment while driving the vehicle to avoid distraction and causing an accident.

3. Before starting the engine, you should pull the handbrake, especially the front wheel, and put the shift lever in neutral (manual transmission) or [P] gear (automatic transmission) so as not to start the engine and make the vehicle injure people.

4. The exhaust gas from the engine contains a variety of toxic compounds (such as hydrocarbons, carbon monoxide, nitrogen oxides, etc.), which will lead to slow response and even serious personal injury or death. The vehicle under test should be parked in a well-ventilated place during operation.

5. Take extreme care when working around ignition coils, distributor caps, ignition lines and plugs. These components generate dangerous voltages when the engine is running.

6. To avoid damaging the testing equipment or generating

incorrect data, please ensure that the vehicle battery is fully charged and that the connection of the vehicle diagnostic seat is clean and safe.

7. The vehicle battery liquid contains sulfuric acid, sulfuric acid is corrosive to the skin, so you should avoid direct contact between the battery liquid and the skin during the operation, especially do not splash it into the eyes, and do not put it close to the fire.

8. Keep clothing, hair, hands, tools, testers, etc. away from running or hot engine parts.

9. Please use the charger that comes with it. The Company will not be responsible for any damage or loss caused by the use of other chargers not designated by the Company.

10. Keep the testing equipment dry and clean, away from gasoline, water and grease. When necessary, clean the surface of the equipment with a clean cloth coated with a mild detergent.

11. All internal repairs to test equipment must be performed by authorized maintenance organizations or authorized technicians. Attempting to disassemble or modify the device will void the warranty.

This manual uses the following conventions.

PROMPT

Prompt information provides helpful information such as additional operation instructions, tips, and suggestions. Example:

📝 *Notes: The VIN code is usually located on the driver's side, in the lower right corner of the front windshield. The exact location varies from car to car. A VIN code is generally composed of 17 standard characters. The VIN code characters can contain the uppercase letters A to Z and the numbers 1 to 0, but the letters I, O, and Q are not usually used to avoid mispronunciation.*

WARNING

It indicates an imminent hazard that, if unavoidable, will result in death or serious injury to the operator or bystander. Example:

⚠ *Warning: Reading a fault code during troubleshooting a vehicle is only a small step in the diagnostic process. The vehicle fault code is only used as a reference, and parts cannot be replaced directly on the basis of the given fault code definition. Each fault code has a set of test procedures, and the service technician must strictly follow the operating instructions and procedures described in the vehicle service manual to confirm the root of the fault.*

DANGER

It indicates an imminent hazard that, if unavoidable, will result in death or serious injury to the operator or bystander. Example:

⚠ *Danger: You must drive the vehicle in order to perform troubleshooting. Please find someone else to help you. It is dangerous to drive and operate diagnostic equipment at the same time, which can cause severe traffic accidents.*
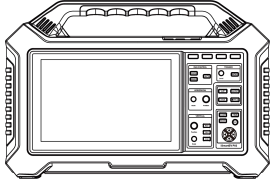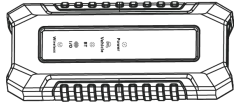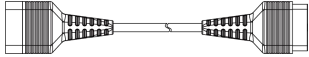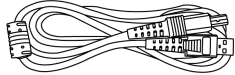
Contents

1. Packing List

Main Unit and Accessories			
No.	**Name**	**Q'TY**	**Reference Picture**
1	iSmartEV P03	1	
2	iSmartEV BOX	1	
3	OBD II Extension Cable	1	
4	USB Cable （Type-B）	1	
5	Switching Power Supply（12V 5A）	1	

6	OBD I Transfer Cable	1	
7	Cigarette Lighter	1	
8	Light Fuse	2	
9	Non-16pin Adaptor Cable Kit	1	-
10	Password Envelop	1	-
11	Quick Reference Guide	1	-
12	User Manual	1	-
13	Packing List	1	-

Battery Jumper Adapters			
No.	Name	Q'TY	Reference Picture
1	Jumper Cable (Jump-8)	1	
2	Matching Adapter 1	4	
3	Matching Adapter 2	4	
4	Matching Adapter 3	4	
5	Matching Adapter 4	4	
6	Matching Adapter 5	4	
7	Matching Adapter 6	4	
8	Matching Adapter 7	4	
9	Matching Adapter 8	4	
10	Matching Adapter 9	4	

Other Accessories			
No.	Name	Q'TY	Reference Picture
1	Oscilloscope Test Clip	2	
2	Oscilloscope Pin Kit	1	
3	Oscilloscope Crocodile Chuck (Black)	1	
4	Oscilloscope Crocodile Chuck (Red)	1	
5	Multimeter Test Lead (Black)	1	

6	Multimeter Test Lead (Red)	1	
7	Insulation Tester Test Clip	1	
8	Current Clamp	1	
9	Current Clamp Test Clip	1	
10	9V Square Battery	1	

2. Product Introduction

2.1 Overview

iSmartEV P03 is a professional integrated detection tool for new energy vehicles developed by SMARTSAFE. It supports the detection of new energy vehicles and vehicle battery packs. It integrates professional measuring tools for new energy vehicles such as oscilloscope, multimeter, insulation test and current clamp.

2.2 iSmartEV P03
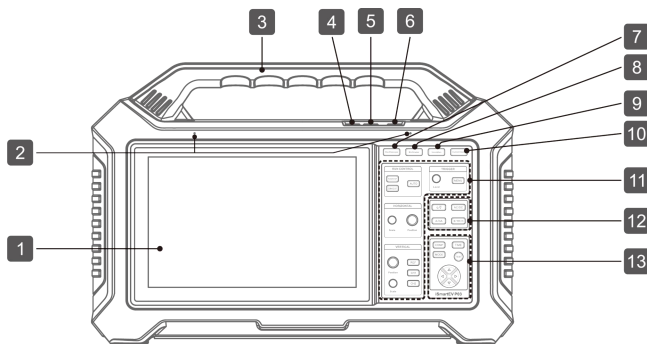
1. Touch Screen

2. Microphone

3. Handle

4. Volume-

5. Volume+

6. Power Button / Lock Screen Button

- In the shutdown state, press the button for about 3 seconds to start the equipment.

- In the startup state, press the button to wake up / turn off the screen. (In the startup state, press the button for more than 3 seconds to select shutdown or restart; press the button for about 8 seconds to force shutdown.)

7. Oscilloscope

8. Multimeter

9. Insulation

10. Current Clamp

11. Oscilloscope Function Button Area

12. Multimeter Function Button Area

13. Insulation Test Function Button Area
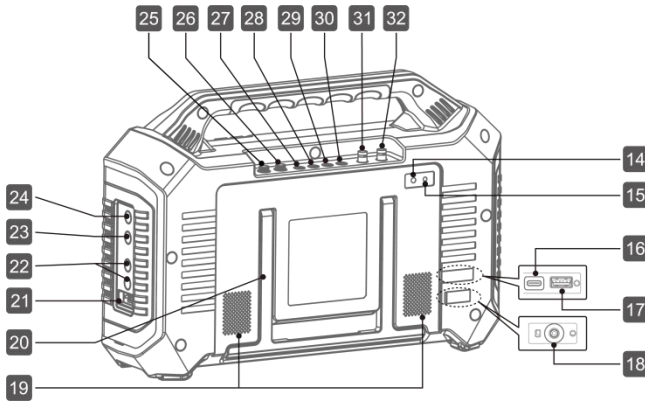
14. Rear Camera

15. Flashlight

16. USB Type-C

17. USB Type-A

- Used to connect the power adapter for charging or connect the computer for data transmission.

18. DC 12V Power Jack

19. Loudspeaker

20. Holder

21~24 are related interfaces of insulation function module:

21. Insulation Test Calibration Port

22. LINE/Line End (Double Headed Red Line)

- The high-voltage output port is connected to the high-voltage conductor of the detected equipment.

23. GUARD/Shielded Terminal

- Connected to the high-voltage retaining ring of the detected equipment to eliminate the influence of surface leakage current.

24. EARTH/Ground Terminal

- Connected to the shell or ground of the detected equipment.

25~30 are related interfaces of multimeter function module:

25. Fuse (500mA/600V)

26. Fuse (12A/600V)

27. 10A Current Input Terminal

28. Milliampere/Microampere (Less Than 400ma) Current Input Terminal

29. Negative Common Terminal

30. Voltage/Resistance And Other Input Terminals

31~32 are related interfaces of oscilloscope function module:

31. Oscilloscope Channel 2

32. Oscilloscope Channel 1

2.3 iSmartEV BOX

The device is a Vehicle Communication Interface (VCI) device, which is used to connect the vehicle diagnosis seat or battery pack low-voltage signal communication interface for data collection, and then send the data to the host for analysis.
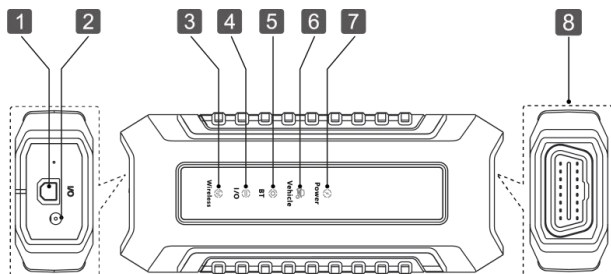
No.	Name and Description
1	USB Type-B
2	DC 12V Power Supply Jack
3	Wi-Fi Indicator
4	USB Indicator
5	Bluetooth Indicator
6	Vehicle Communication Indicator

7	Power Supply Indicator
8	OBD-II Port

2.4 Technical Parameters

2.4.1 iSmartEV P03

Item	Specification Parameters
Operating System	Android 10.0
CPU	8-core Processor, 2.0GHz
Memory	8GB
Storage	256GB
Display Screen	10.1-inch Touch Screen, 1920*1200 Resolution
Camera	13 Million Rear Camera
Wi-Fi	2.4GHz/5GHz Dual Wi-Fi
Communication	Wi-Fi, Bluetooth, USB
Battery	7.6V/9360mAh
Operating Temperature	0℃ ~ 45℃
Storage Temperature	-20℃ ~ 70℃

2.4.2 iSmartEV BOX

Item	Specification Parameters
CPU	Cortex A7 + Cortex-M7
System	Linux
Internal Storage	256M
Storage	8GB
Port	Type B、ODBII-16、DC-IN
Communication	Wi-Fi, Bluetooth, USB
Working Voltage	DC 9~36V
Working Temperature	0℃ ~50℃
Storage Temperature	-20℃ ~70℃

3. Initial Use

3.1 Charge the Tablet

⚠ *Warning: Please use the charger that comes with the product for charging. We are not responsible for any damage or economic loss caused by charging with a charger other than the one designated by us.*

Please follow the following steps to charge the iSmartEV P03 tablet:

1. Insert one end of the switching power supply into the DC power jack of the host, and connect the other end to the power socket.

2. If the battery identifier on the screen is displayed 🔋, then the battery is being charged.

3. When the battery identifier is displayed 🔋, the charging is complete.

📝 *Note:*

If the device has not been used for a long time or the battery power of the device is exhausted, you may not be able to turn it on normally when charging. This is a normal phenomenon. Please charge the device for a period of time and then try to start the device.

The battery can be recharged. But because the battery is a wear and tear product, after a long time of use, the standby time of the device will be shortened. So please avoid frequent and repeated charging to prolong the battery life.

3.2 Turn On/Off

3.2.1 Turn On

Press and hold the power button on the device until the screen

lights up.

3.2.2 Turn Off

Press and hold the power button on the device until the shutdown prompt dialog box pops up on the screen, tap **Power off** to shut down the device or tap **Restart** to restart the device.

3.3 Network Connection

When using the device for the first time, you need to register a personal account, activate the VCI connector, and upgrade the diagnostic software or APK. In this case, the device must be connected to the Internet. For details on wireless network connection, please refer to chapter 16.4.

3.4 Registration and Update

During the first use, the user needs to follow the following operations:

Create an Account

↓

Activate VCI

↓

Finish Registration

↓

Software Update
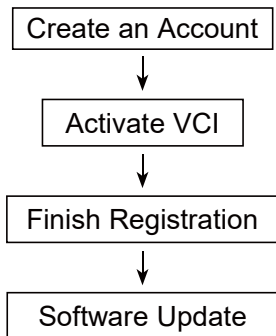
Note: Before registration, ensure that the network connection to the host is normal and stable.

On the main interface, click **Other** -> **Personal Center** -> **Login**, and the following dialog box will pop up:
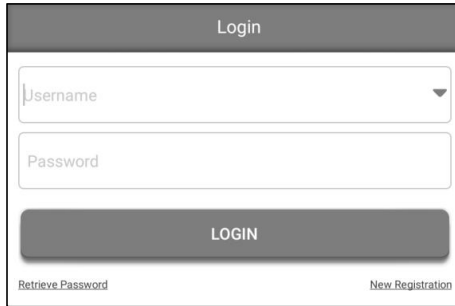
(If you are a new user, follow Section A.)
(If you are registered, please refer to Section B for login.)
(If you forget your password, please refer to Section C to reset it.)

A. If you are a new user, please tap **New Registration** to enter the registration page.
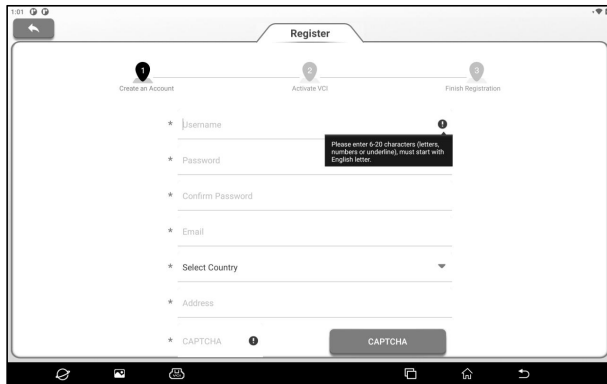
In the figure above, fill in the registration information in turn (the item with * is required). After the account information is filled in, tap **Register**, and the system will enter the interface of connector activation.

13
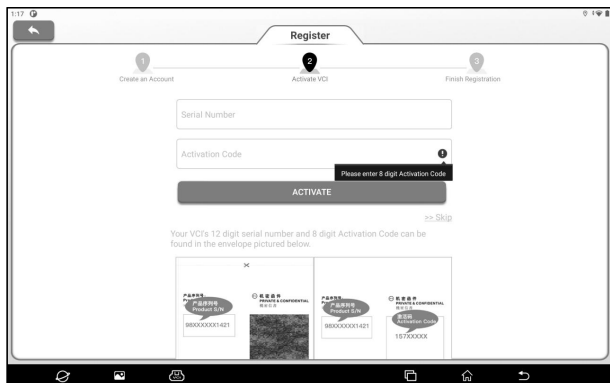
Enter the product serial number and activation code. The product serial number and activation code can be obtained from the password envelope in the package box.
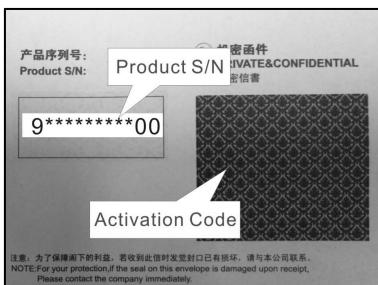
*Note: If you skip the activation step here, you can also go to **Other** -> **Personal Center** -> **Activate VCI** to activate after entering.*

Tap **Activate** to complete the registration.
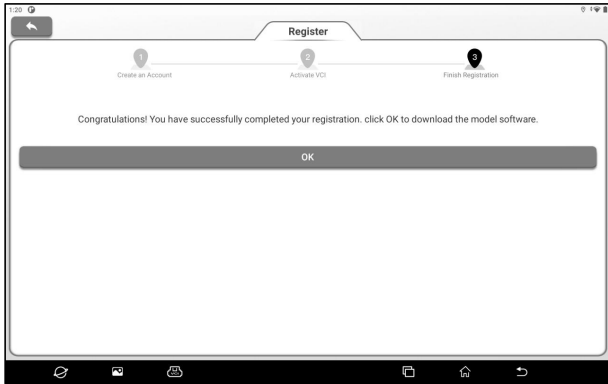
Tap **OK** to enter the software update interface.
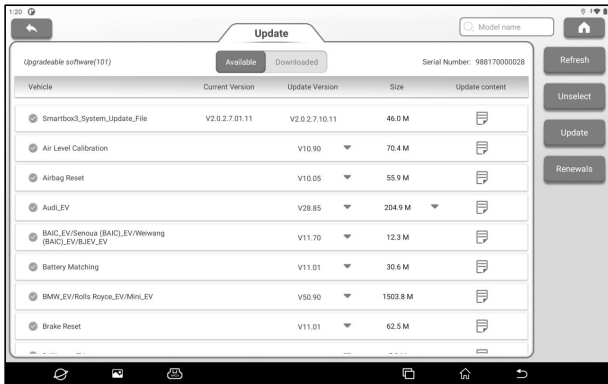
On the software update page, tap **Update** to start downloading. After the download is complete, the system will automatically install the software.

📘 Note: During the update, ensure that the network connection is normal. In addition, due to the large number of software, it may take a long time (depending on the network speed). Please wait patiently.

B. If you have already registered, input the user name and password and tap **Login** to enter the account.

⧉ Prompt: The device has the user information memory function. If multiple accounts have logged in to the device, click the triangle drop-down button behind the user name input box to select the corresponding account to log in.

C. If you forget the password, please tap **Retrieve Password** and then set the new password according to the prompts on the screen.

4. Getting Started

4.1 Main Interface and Bottom Navigation Bar

4.1.1 Main Interface

The main interface of iSmartEV P03 host mainly includes the following functional modules:
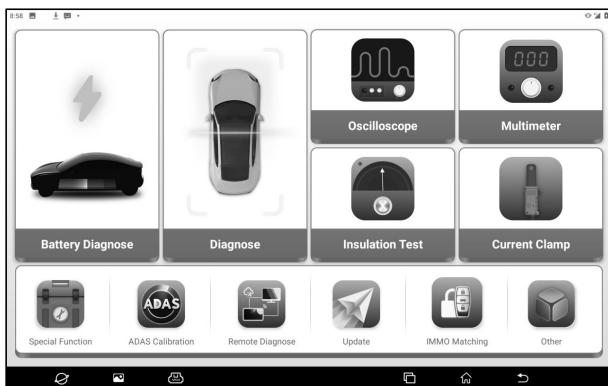
Items	Description
Battery Diagnose	Used to perform in-depth system detection on vehicle battery packs.
Diagnose	Used to detect the electronic control system of the whole vehicle.
Oscilloscope	Used to measure the voltage signal and analyze the form of the electronic signal.
Multimeter	Used to measure voltage, current, resistance, diode and on-off condition.

Insulation Test	Used to measure the insulation resistance of electrical equipment.
Current Clamp	Used to perform AC/DC current test and DC voltage test.
Special Function	Used to perform common special functions such as vehicle maintenance, service and adjustment.
ADAS Calibration	This function module needs to work with the specified ADAS calibration tool (purchased separately, for example, ADAS mobile) to calibrate the ADAS (Advanced Driver Assistance System).
Remote Diagnosis	Used to remotely assist the user in diagnosing the vehicle.
Update	Support one-click upgrade of battery pack software, vehicle software, operating system, client and firmware.
IMMO Matching	This function enables you to perform the anti-theft key matching function, so that the immobilizer control system on the car identifies and authorizes remote control keys to normally use the car.
Others	Including functional modules and system apps such as reports, personal center, feedback, setting, files, remote control, browser, system OTA upgrade, photo album, recording master, player, email and camera and other functional modules and system apps.

4.1.2 Bottom Navigation Bar

The bottom navigation bar contains the following buttons:

Icon	Name and Function Description
♁	Browser-click this button the start the browser.
🖼	Screenshot-click this button to capture and save the current screen image. The screenshot is saved in the Screenshots folder.
🔌	VCI connection indicator-after the host is successfully connected to the VCI connector, this button lights up in green.
⧉	Backstage Management - Click this button to display a list of recently used App thumbnails. Click on any of the thumbnails to open the corresponding program, hold the thumbnail to slide upward to close the corresponding program.
⌂	Main interface-click to return to the main interface.
⤺	Return-click to return to previous page.

4.2 Communication Settings

The main connection modes of the tablet and VCI connectors are Wi-Fi communication and USB cable communication.

4.2.1 Wi-Fi Communication

The tablet will prompt the user to register and activate the VCI connector during the first use. Once the activation is complete, the tablet will automatically match with the VCI connector and establishes a Wi-Fi connection. At this time the VCI connector icon 🔌 at the bottom of the screen lights up and the Wi-Fi indicator of the VCI connector is also on.

4.2.2 USB Communication

When the tablet and VCI connectors are connected through USB cables, the system automatically switches to USB communication mode. At this time the VCI connector icon at the bottom of the screen will light up, and the USB indicator of the VCI connector will also light up.

5. Battery Diagnose

This function is used to check the detailed data and fault information of battery pack, helping users to quickly determine the abnormal status and fault point of battery pack.

⚠ *Danger: The personnel who operate the battery pack test must wear protective equipment such as insulation gloves, insulation shoes and goggles. Operating the battery pack without protection can cause a serious electric shock.*

1. Start the iSmartEV P03 and tap **Battery Diagnose** on the main interface.
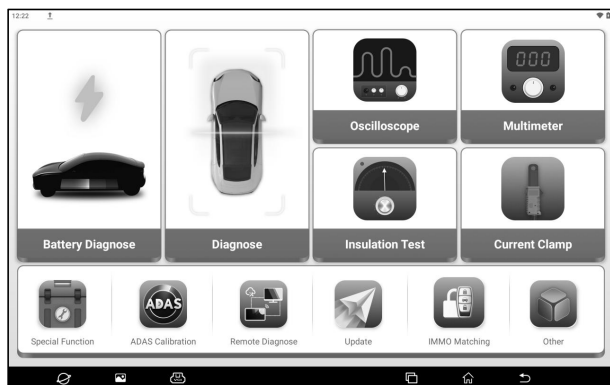
2. Select the vehicle brand or battery pack brand (You can find it quickly through the search bar in the upper right corner).
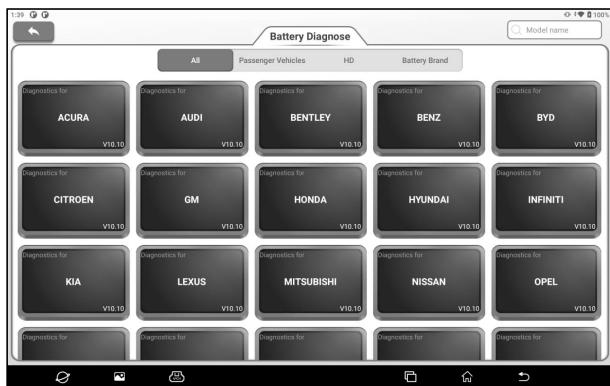
Select the vehicle model and year.

3. Select the connection method of battery pack.
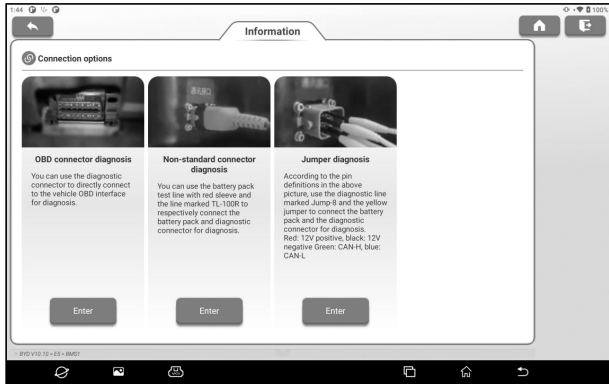
A. OBD Connector Diagnosis

The battery pack of the vehicle was tested by connecting the iSmartEV BOX to the vehicle OBD interface through an OBD extension cable.
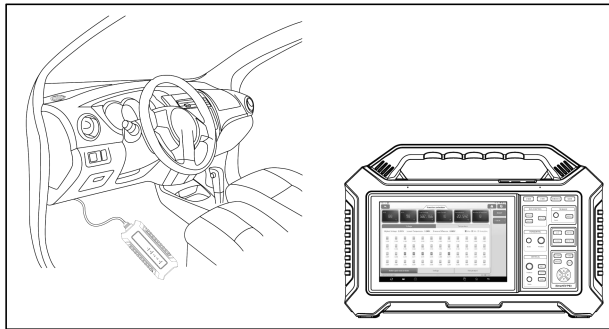
B. Non-standard Connector Diagnosis

Connect the iSmartEV BOX and the low-voltage signal communication interface of the battery pack respectively with the battery pack special connector (optional) to test the vehicle battery pack.
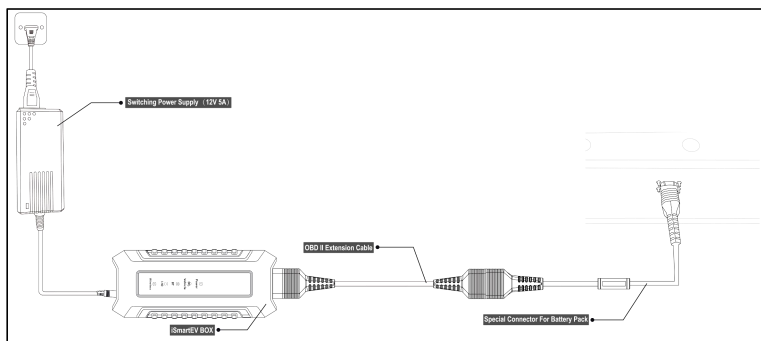
C. Jumper Diagnosis

According to the wiring diagram prompted by the software, the jump-8 jumper is used to connect the iSmartEV BOX and the low-voltage signal communication interface of the battery pack respectively to detect the battery pack of the vehicle.

Note: The picture here is an example only. The connection mode varies with vehicle types. Please connect based on the wiring diagram prompted by the software.
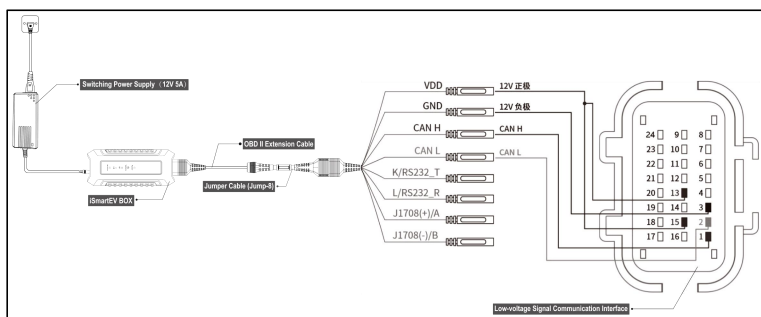
4. After the connection is complete, the device automatically reads and displays the detailed data of the battery pack. Users can determine the abnormal status of the battery pack based on the detection data.

Description for Screen Buttons:

🏠 **Main Interface**	Click to return to the main interface.
▭ **Exit**	Click to exit the current detection process.
Report	Click to view/save the detection report of battery pack.
Reference Value	Click to select the voltage reference range of different types of batteries.

Function Description:

Battery Pack Data Analysis	Used to display the voltage and temperature of each cell in the battery pack and mark the highest/lowest voltage cell and the highest/lowest temperature cell in the battery pack.
Voltage	Used to display the voltage parameters of each module in the battery pack and mark the highest/lowest voltage cell in the battery pack.
Temperature	Used to display the temperature parameters of modules and other parts in the battery pack, and mark the maximum/minimum temperature cell in the battery pack.

6. Diagnose

This function is mainly used for vehicle diagnose. Users can use **AutoDetect** to quickly identify vehicle information and enter the system for vehicle diagnose, or manually select models and systems for detection.

6.1 Preparation

- The vehicle ignition is turned on.
- The vehicle battery voltage range is 11~14 volts or 23~26 volts.
- The throttle is in the closed position.
- Find DLC location.
- The DLC (Data Link Connector) is usually located 12 inches from the center of the instrument panel, under or around the driver's side for most vehicles. For some vehicles with special designs, the DLC location may vary.
- If the DLC cannot be found, refer to the vehicle's service manual for the location.

6.2 Vehicle Connection

Follow the steps mentioned below to connect OBD II vehicle: Connect one end of the included diagnostic cable to the OBD-II port of iSmartEV BOX, and the other end to the vehicle's DLC port.
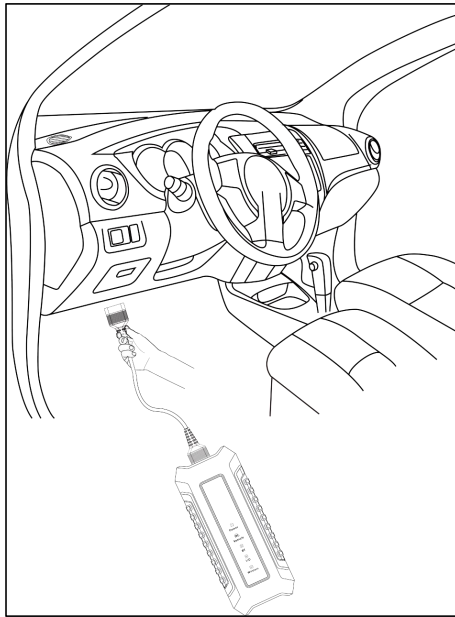
For non-OBDII vehicle, proceed as follows:

1. Select the corresponding adaptor cable according to the vehicle's DLC type.
2. Plug the non-16pin end of the adaptor cable into the vehicle's DLC port, then connect the other end to the OBD I transfer cable, and then tighten the captive screws.
3. Connect the other end of the OBD I transfer cable to the diagnostic cable.
4. Connect the other end of diagnostic cable to the OBD-II port of iSmartEV BOX.

6.3 AutoDetect

Use **AutoDectect** to quickly identify vehicle information and vehicle diagnose, without manual selection of vehicle type.

Tap **Diagnose** -> **AutoDetect** on the main interface to enable the intelligent detection function of vehicles.
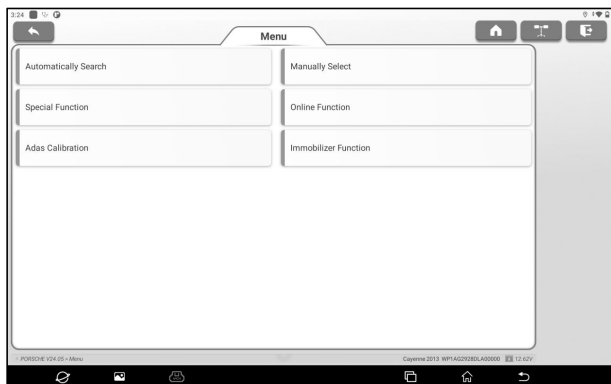
Some models may not be able to identify the vehicle information through the intelligent detection function. In this case, the following dialog box will pop up for the user to scan or manually input the vehicle VIN code.
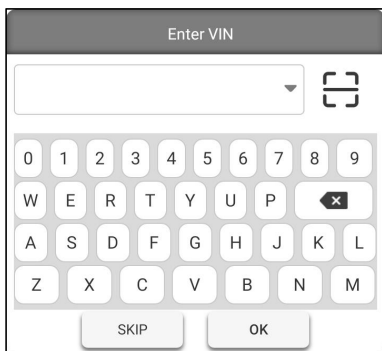
6.4 Manual Selection

1. Tap **Diagnose** on the main interface to enter the vehicle brand selection interface.

2. Click the vehicle brand to be tested to enter the model version information interface. Here we take Demo (Version 15.43) as an example to demonstrate how to diagnose a vehicle.
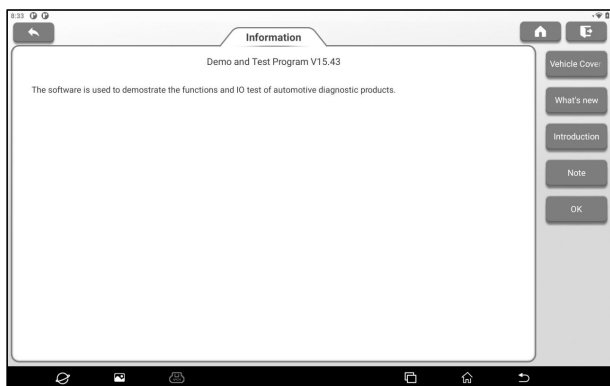
Screen Button Description:

Vehicle Coverage	Click to view the current vehicle models that can be tested.
What's new	Click to view the updated points of the current diagnostic software.
Introduction	Click to view the specific use of the current diagnostic software.

Note	Click to view precautions when using the current diagnostic software.
OK	Click to go to the next step.

3. Tap **Demo** to go to the next step.

4. Select vehicle brand and model. Here we take **VW** as an example.
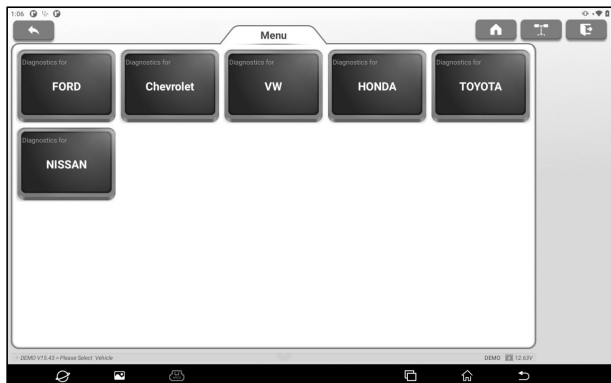
5. Select the scan option that need to perform.
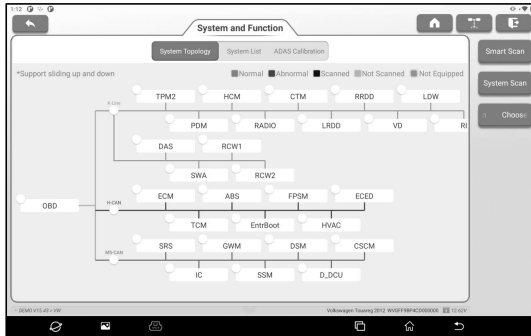
The system supports two display modes: topological diagram and list. User can also tap **ADAS Calibration** to perform ADAS related test options of vehicles .

📖 Note: The specific system and special functions provided depend on the vehicle type.

6.4.1 Smart Scan

This function is used to quickly detect the vehicle and output the vehicle health report directly (this will only be displayed for the vehicle testing software supports this function.)

Tap **Smart Scan** on the test option selection interface, and the system starts to scan each system for faults code.
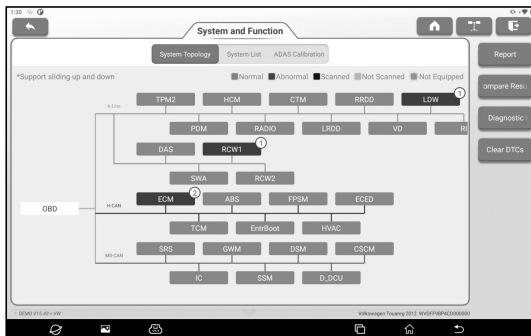
The system with fault codes will be displayed with red background, and the specific number of fault codes will be displayed. Click on a single system to view specific fault information. No fault system will be displayed with green background.

Screen Button Description:

Report	Click to save the current fault report as the detection report. Click ▼ to select the report type from the drop-down list, then enter the details and tap **OK**. 📇 *Note: Diagnostic reports can be classified into Pre-Repair Report, Post-Repair Report and Diagnostic Scan (if no comparison is required, you can select Diagnostic Scan). The device has the report comparison function, so you need to select a correct report type when saving reports. By comparison, maintenance technicians can clearly understand whether the fault codes found before diagnosis have been completely cleared after maintenance.*

	Enter the shop name and then tap **OK** to enter the report details view page.
	On the report details page, tap **Save** to save the report. All diagnose reports are stored in the **Other** -> **Reports** -> **Diagnostic** tab.
Compare Results	Click to select the report before maintenance. By comparing the reports before and after maintenance, the maintenance technician can clearly understand whether the fault codes found before maintenance have been completely cleared after maintenance.
	Note: Before performing this function, please ensure that: • *The Pre-Repair inspection report of the current test vehicle has been saved; and* • *Repairs have been carried out on the basis of the inspection report before maintenance, and the code has been cleared. Otherwise there will be no difference between the reports before and after the maintenance*
Diagnostic Plan	Click to view the reason analysis of the fault code.
Clear DTCs	Click to clear all the fault codes. *Note: For general models, please strictly follow the conventional sequence: read the fault code first, then clear the fault code, test run, read the fault code again for verification, repair the vehicle, clear the fault code, test run again to confirm that the fault code does not appear.*

6.4.2 System Scan

This function is used to scan which systems the vehicle is

equipped with.

Tap **System Scan** on the test option selection interface, and the system starts to scan the vehicle system. After the scan is completed, the screen will display the scan results.
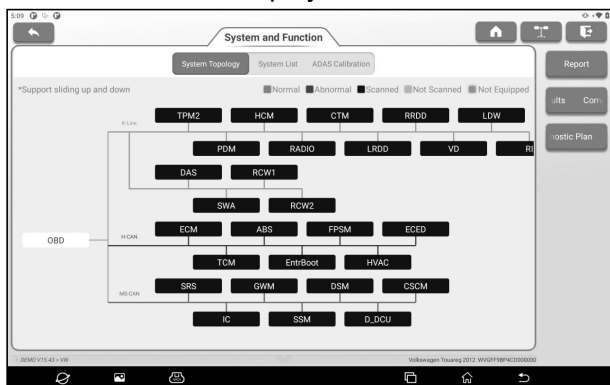
The user can manually select the vehicle electronic control system to perform the test function operation. Click a single electronic control system (such as "ECM") in the test option selection interface, and then tap **Enter** to go to the test function selection page.

📝 Note: Different models may have different test menus.

A. Module Information

This function is used to read the ECU version information of the current vehicle.

B. Read DTC

This function is used to read the diagnostic trouble code existing in the current car ECU, and help maintenance personnel quickly understand the cause of vehicle failure.

Tap **Read DTC** on the test function selection page, and the screen will display the following detection results.

⚠ *Warning: Reading a diagnostic trouble code while troubleshooting a vehicle is only a small step in the diagnostic process. The vehicle DTC is only used as a reference, and parts cannot be replaced directly on the basis of the given DTC definition. Each DTC has a set of test procedures, and the maintenance technician must strictly follow the operating instructions and procedures described in the vehicle maintenance manual to confirm the root of the fault.*

Screen Button Description:

Freeze Frame	If the button is highlighted, the frame is frozen. The freezing frame function is to record the values of some specific data streams at the moment when the car breaks down for verification.
Data Stream	Click to read and display the car ECU real-time operation data and parameters.
Help	Click to view the possible cause of the DTC.
Code Search	Click to search for a specific explanation of the DTC online.
Report	Save the current test result as a test report. All test reports are stored in the **Other** -> **Reports** tab.

C. Clear Fault Code

This function is used to clear fault codes stored in the ECU of the system under test.

In the test function selection page, Tap **Clear Fault Code**, the system will pop up a dialog box of confirming clearing, Tap **Yes** to confirm the clearing of the fault code.

Note: For general models, please operate in strict accordance with the conventional sequence: read the fault code first, then clear the fault code in the test run, read the fault code again for verification, repair the vehicle, clear the fault code, and confirm the fault code does not appear in the test run again.

D. Read Data Stream

This function is mainly used to read and display the real-time operation data and parameters of automobile ECU. By observing these real-time data streams, maintenance technicians can gain insight into the overall performance of the vehicle and provide guidance for vehicle maintenance.

Danger: If you must drive the vehicle while performing troubleshooting, please ask someone else to help you. Driving and operating diagnostic equipment at the same time is dangerous and can cause serious traffic accidents.

Tap **Read Data Stream** on the test function selection page, and the system enters the data stream selection page.
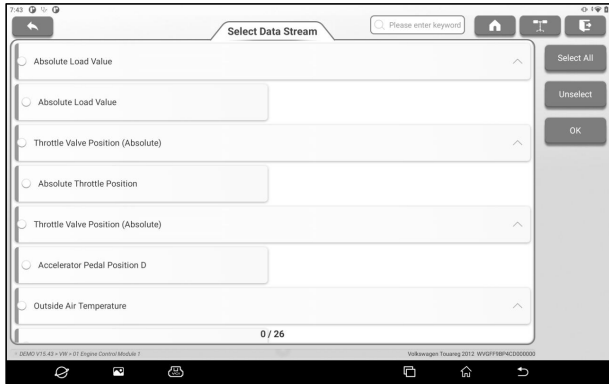
Screen Button Description:

Select All	Select all data stream options.
Unselect	Click to cancel all the selected data stream options.
OK	Confirm the current operation.

Tap **OK**, the system will display the dynamic data of the selection.

📑 *Note:*

Style set		
Absolute Load Value	B	A
Throttle Valve Position (Absolute)	B	A
Accelerator Position	B	A
Outside Air Temperature	B	A
CANCEL	OK	

1. Click 🔲 *, the left popup will appear on the screen:*

Users can set different display styles for each data stream option according to personal preferences.

B Indicates that the current data stream will be displayed in bold.

A Indicates that the current data stream will be displayed in red.

*2. Tap **English / Metric** to switch units.*

3. If the read data stream value is out of the standard value range, the data stream is displayed in red.

Screen Button Description:

〰️ **(Single Graphic)**	Click to display the current (single) data stream as a waveform diagram. 📑 *Note: The waveform can be zoomed in or out. Tap the screen with two fingers (thumb and index finger, for example), then slide the fingers to adjust the distance between the fingers to zoom in and out of the screen.* • Min/Max Limit: Click to set the maximum/minimum value.
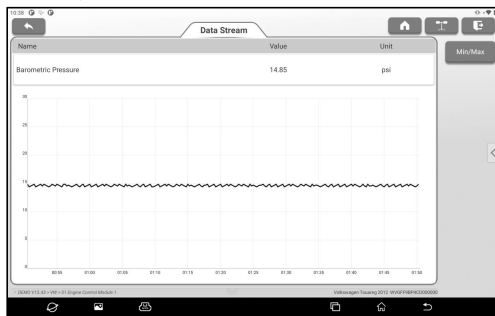
	Once the running value exceeds the set value, the system will issue a warning.
Report	Click to save the current data stream value as a report. The saved test report is stored in **Other** -> **Reports** -> **Diagnostic**.
Record	Click to start recording test data. The recorded test data can provide an important reference for technicians to troubleshoot vehicle problems. To stop reading, click the button ⬤ in front of the progress bar. *Note: The saved file is named after vehicle type +VCI device serial number + system time when recording starts. To distinguish file names, please set the correct system time.*

E. Actuation Test

This function is mainly used to test whether the executive component in the electronic control system can work normally.

6.4.3 Choose to Scan

This function is used to select the vehicle electronic control system required by the user for scanning. In the test option selection interface, check the check box in front of the system to be scanned, and then tap **Choose to Scan** to start scanning the selected system.

7. Oscilloscope

This function module is mainly used to measure voltage signals and analyze the form of electronic signals. Automobile repair technicians can quickly judge the fault of automobile electronic equipment and circuits by observing the waveform of the whole signal.

7.1 Technical Parameters

Number of Channels:

2

Bandwidth:

10MHz

Maximum Real-time Sampling Rate:

100Mbps

Time Base Range:

1us/div～10s/div, step by 1 ~ 2 ~ 5 times

Sampling Mode:

Common sampling, peak detection, average value

Storage Depth:

1M

Input Coupling:

DC, AC and Grounding

Input Impedance:

1MΩ±2%

Input Capacitance:

20pF (maximum)

Vertical Sensitivity:

2mV/div～5V/div

Vertical Resolution:

8bits

Maximum Input Voltage:

40V peak (DC + AC peak)

Probe Attenuation Coefficient:

1X, 10X (probe support required)

Trigger Type:

Edge trigger, pulse width trigger

Trigger Mode:
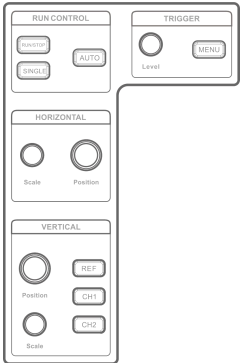
Automatic, normal, single time

Automatic Measurement:

Peak-to-peak, average, maximum, minimum, frequency, period

7.2 Initial Use

P03 is equipped with the oscilloscope function button area. In addition to operating through the screen touch button, you can also set and control the oscilloscope function module through the buttons in the function button area.

Button Position	Button Identification	Button Description
	RUN CONTROL Running Control	**RUN/STOP** **AUTO:** automatic **SINGLE:** single trigger
	TRIGGER Trigger Level control	**Position** (press to return to zero) **Level:** trigger level setting knob
	HORIZONTAL Horizontal Control	**Position:** horizontal position adjustment knob (press to return to zero) **Scale:** horizontal time base adjustment knob
	VERTICAL Vertical Control	**Position:** vertical position adjustment knob (press to return to zero) **Scale:** voltage range adjustment knob **REF:** reference channel **CH1:** channel 1 **CH2:** channel 2

7.2.1 Getting Started

Tap **Oscilloscope** on the main interface or click the oscilloscope function switching button on the upper right corner of the host to enter the oscilloscope function module page.

No.	Description	Operation Prompt
1	**Menu** Include the following options: • **Measure**: provide 6 parameter measurement items. • **Save**: Set the save format and save path of channel waveform. • **Show**: Set the waveform display style. • **User Settings**: Provide functions such as data clearing, oscilloscope setting and automatic calibration. • **About**: Display the specific information of the program.	Click once to expand the submenu. Click again to retract the submenu. You can also click the "Menu" button in the function button area to expand/retract the submenu.
2	**Car Test** It provides various vehicle related test content (such as circuit, sensor, actuator, commnication test, combined test) and corresponding test connection methods.	Click once to expand the submenu. Click again to retract the submenu.
3	**Trigger** Used to set trigger channel and trigger type.	Click once to expand the submenu to set channels and conditions. Click again to retract

		the submenu.
4	**Horizontal Trigger Position Mark**	Press and hold ▼ and drag left and right or use the "horizontal position adjustment knob" in the function button area to adjust the horizontal trigger position.
5	**Save** It can quickly save the measurement waveform of the currently open channel.	To change the save path and file type, tap **Menu** -> **Save** to set.
6	**Horizontal Setting** Control the horizontal time base.	Click once to expand the horizontal time base option and select the appropriate time base value, or use the "horizontal time base adjustment knob" to adjust to the appropriate time base value.
7	**Single Trigger** Capture a trigger, complete the acquisition, and then stop.	
8	**Automatic** Click to enable the automatic range function. When the automatic range function is enabled, the oscilloscope will automatically set various parameters, including vertical scale, horizontal time base and trigger level. When the signal is connected, these parameters will change automatically, and there is no need to operate again after the signal changes. The oscilloscope will automatically recognize and make corresponding changes.	You can also click the "AUTO" button in the function button area to enable the automatic range function.
9	**Wait/Run/Stop** **Wait**: All pre-triggered data has been obtained, and the oscilloscope is ready to receive the trigger.	You can also click the "RUN/STOP" button in the function button area to operate.

	Run: Indicates that the oscilloscope is running. **Stop**: Stop collecting data.	
10	**Cursor Settings** ▤ Turn on/off the horizontal measurement cursor switch. When it is turned on, two reference lines named Y1 & Y2 will appear in the waveform display area of the screen; ▥ Turn on/off the vertical measurement cursor switch. When it is turned on, two reference lines named X1 & x2 will appear in the waveform display area of the screen.	Click once to enable the cursor measurement function. Click again to disable the function.
11	**Channel 1 Setup Panel** Control the amplitude of the displayed signal. You can set the inversion, coupling mode and probe attenuation coefficient.	When the channel is enabled, click [CH1] / [CH2] once to disable the channel and hide the channel setting menu.
12	**Channel 2 Setup Panel** Control the amplitude of the displayed signal. You can set the inversion, coupling mode and probe attenuation coefficient.	Click it again to enable the channel and expand the channel setting menu. You can also click the "CH1" and "CH2" buttons in the function button area to set the channel.
13	**REF (Reference) Channel Setting** Set the reference channel.	In the channel setting panel area, press and slide the screen up to call up the REF reference channel button, and click this button to call up the reference channel setting menu. You can also click the "REF" button in the function button area to set the reference channel.
14	**Edge Trigger Level Identification**	Press and hold the logo to drag or adjust it through the "LEVEL" knob in the function button area.
15	**Channel 2 Voltage Scale**	Click +/- or adjust the voltage

		scale of channel 2 through the "voltage range adjustment knob" (need to set channel 2 as the current channel) in the function button area.
16	**Horizontal Time Base**	
17	**Measured Value Display Area**	It can be called up through **Menu** -> **Measure**.
18	**Channel 1 Mark** Indicate the reference point of the displayed waveform. If there is no mark, the channel is disabled and will not be displayed.	
19	**Channel 2 Mark** Indicate the reference point of the displayed waveform. If there is no mark, the channel is disabled and will not be displayed.	
20	**Waveform Display Area**	
21	**Channel 1 Voltage Scale**	Click +/- or adjust the voltage scale of channel 1 through the "voltage range adjustment knob" (need to set channel 1 as the current channel) in the function button area.

7.2.2 Automatic Calibration

The automatic calibration program can optimize the oscilloscope signal path with maximum measurement accuracy. Users can run this program at any time, but should run this program if the ambient temperature changes more than 10°C or above. In order to calibrate more accurately, the oscilloscope must be powered on and preheated for 20 minutes before automatic calibration. The correction content mainly includes the correction of analog channel, the correction of trigger voltage in trigger circuit and the

correction of horizontal baseline shift nonlinearity.

📑 Notes: During automatic calibration, ensure that no signal is input at the input end of CH1/CH2, otherwise the instrument may be damaged.

Choose **Menu** -> **User Settings**, and then tap **Automatic Calibration**.
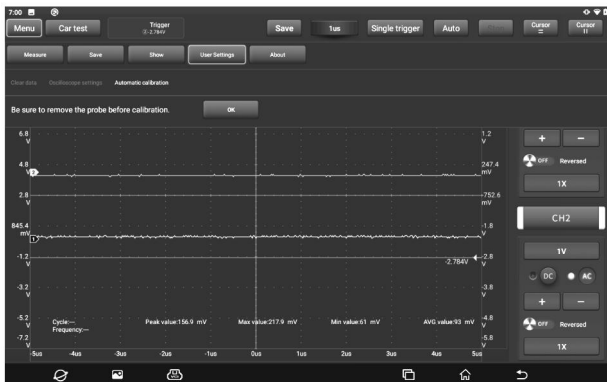
Tap **OK** button on the pop-up window to start calibration. The prompt message "Calibrating...please wait." will appear on the screen. After the calibration is completed, a prompt box of "Calibration success" will pop up on the screen.

7.2.3 Connection

When detecting the sensor:

1. Connect one end of the BNC connector of the oscilloscope test clip to the channels CH1/CH2 (select the channel number and the channel quantity as appropriate), connect the other end of the black connector to the black pin, and connect the red connector to the pins of other colors.
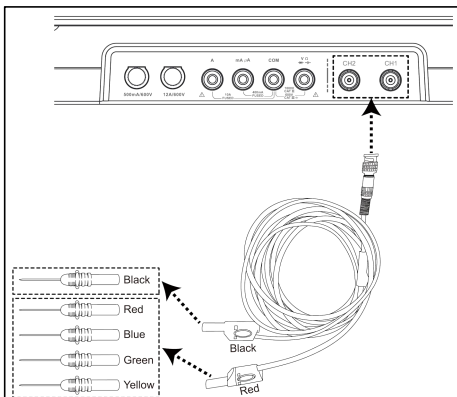
2. Connect the black pin to the ground wire port of the vehicle sensor, and insert the pins of other colors connected to the red connector on the signal terminal of the vehicle sensor.

7.3 How to Operate

7.3.1 Channel Selection

The system has CH1 (channel 1), CH2 (channel 2) and REF (reference channel). Select the channel as follows:

A. Select the channel through the channel button on the right side of the screen.
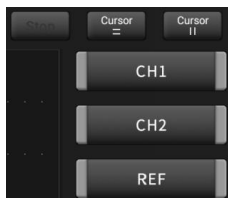
B. Select the target channel through the channel button in the function button area.
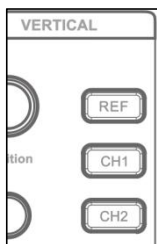
Notes: In order to facilitate users to better compare and distinguish, all channels and waveforms are marked with different colors.

The oscilloscope can display multiple waveforms at the same time, but only one waveform is allowed to be preferentially displayed on the top layer. The channel preferentially displayed on the top layer is called the current channel, and it will be marked with ▶. The channel without this identifier is not the current channel.

7.3.2 Channel Attributes and Trigger Settings

1. Horizontal time base setting

The horizontal time base setting can be used to set the scale time size (time base value) of the horizontal axis unit. Click "6-horizontal setting" to expand the time base value option and select the appropriate time base value, or use the "horizontal time base adjustment knob" to adjust to the appropriate time base value.

If the waveform capture has been stopped, the waveform can be enlarged or reduced horizontally by adjusting the horizontal time base.

2. Channel setting panel

You can use the channel setting panel to adjust the vertical scale and other settings of the channel. Each channel has a separate setting panel, and each channel can be set separately.
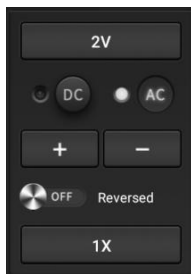
Description of setting options:

Menu Option	Description/Settings
DC/AC Coupling Mode	Trigger coupling is used to define which part of the signal passes through the trigger circuit. Channel coupling includes DC coupling and AC coupling. DC: DC coupling. The DC component and AC component contained in the measured signal can pass through, and can be used to view waveforms as low as 0Hz without large DC offset. AC: AC coupling. The DC signal of the measured signal is blocked and only the AC component is allowed to pass through, which can be used to view the waveform with large DC offset.
Inversion	After the inversion switch is turned on, the voltage value of the displayed waveform is inverted. The inversion will affect the display of the channel. When the basic trigger is used, the trigger level needs to be adjusted to keep the waveform stable.
Probe Type	Select the attenuation coefficient of the probe. The attenuation coefficient changes the vertical scale of the oscilloscope so that the measurement result reflects the true voltage value at the probe.
Vertical Scale Value	Click +/- to adjust the vertical scale value (voltage value).

3. Trigger setting

The trigger determines when the oscilloscope starts to acquire data and displays waveforms. If the trigger setting is reasonable,

it can convert unstable display content or white screen into meaningful waveform. When the oscilloscope starts to acquire the waveform, it will collect enough data to draw the waveform on the left side of the trigger point. When waiting for trigger conditions to occur, the oscilloscope continues to collect data. After the trigger is detected, the oscilloscope continues to obtain enough data to draw the waveform on the right side of the trigger point. Triggering refers to setting certain triggering conditions according to requirements. When a certain waveform in the waveform flow meets this condition, the oscilloscope will capture the waveform and its adjacent parts in real time and display them on the screen. Click "3-trigger" to access the following page:
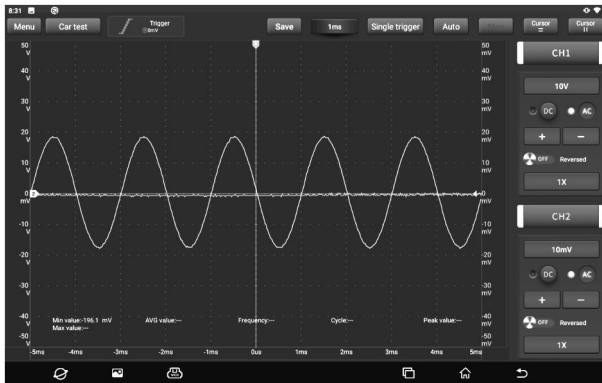
This oscilloscope uses edge trigger, which is the most commonly used and effective trigger mode. Most applications use this trigger mode to trigger waveforms. Edge trigger refers to identifying the trigger by looking for the specified edge (rising edge, falling edge) and voltage level on the waveform. When the voltage change direction of the measured signal is the same as the setting, and its value changes to the same value as the trigger voltage, the oscilloscope is triggered and captures the waveform.

Rising Edge   Dropping Edge

Trigger Point   Trigger Point
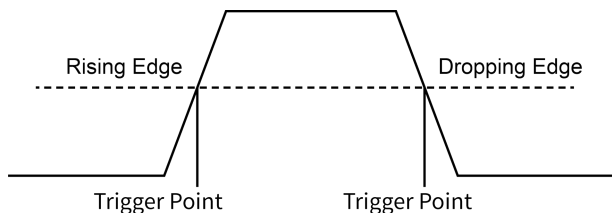
Menu Option	Description/Settings
Source	Select the channel source of the trigger signal.
Trigger	Trigger level: Set the amplitude level that the signal must cross during waveform acquisition. Rising: Triggered at the rising edge. Dropping: Triggered at the dropping edge. Off: Turn off the trigger mode.

In this trigger mode, users can directly drag the edge trigger level icon or use the trigger level setting knob in the function button area to adjust the trigger level.

7.3.3 Automatic Setting

The oscilloscope has the automatic setting function, which can set the oscilloscope to automatically display the waveform in the best way. Tap **Auto**. The system will automatically adjust the horizontal and vertical calibration of the oscilloscope, the triggered coupling, type, position and other settings, so as to obtain stable waveform display.

7.3.4 Menu Operation

1. Measure

The oscilloscope provides 6 types of parameter automatic measurement functions.
Click to select the measurement function. All selected

measurement functions will be displayed on the left side of the "Clear" button. The corresponding values will be displayed at the bottom of the screen.

To remove the measurement function, click again.

Menu Option	Description/Settings
Cycle	The time between the threshold intermediate values of two consecutive, homogeneous edges.
Frequency	The reciprocal of the period.
Peak Value	The voltage value from the peak to the lowest point of the waveform.
Maximum value	The voltage value from the highest point of the waveform to GND (ground).
Minimum value	The voltage value from the lowest point of the waveform to GND (ground).
Average value	The arithmetic average over the entire waveform or selected area.

The following figure explains the meaning of some measurement items and is for reference only.
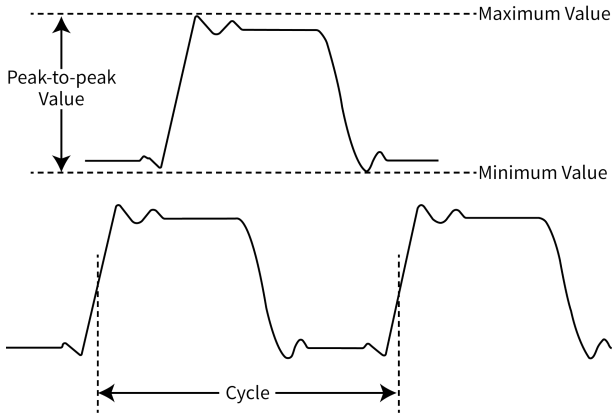
2. Save

The Save option is used to save the waveform of the channel.

Tap **Save** and the screen will display as follows:
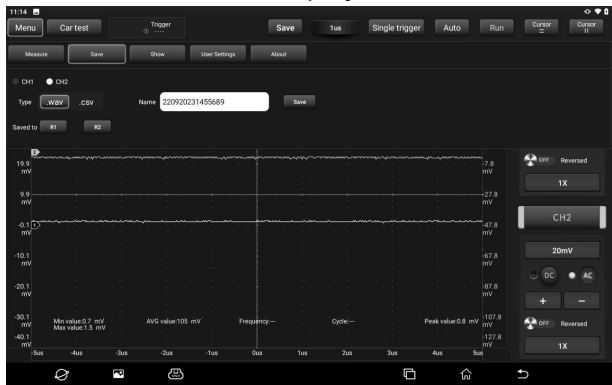
First select the measurement channel, then select the measurement type WAV or CSV, then modify the name and save, and finally select to save to R1/R2. The saved files can be referenced and played back by calling the "REF" reference channel.

3. Show

Show options are used to set waveform brightness and coordinate axis display intensity. Coordinate types include Full, Grid, Crosshair and Frame.
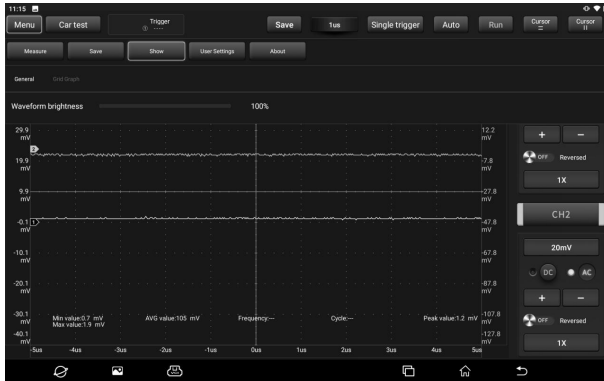
4. User Settings

The user settings option can be used to set data clearing, automatic calibration of waveform display, storage and recovery of oscilloscope parameters, etc. Tap **User Settings** and the screen will display as follows:
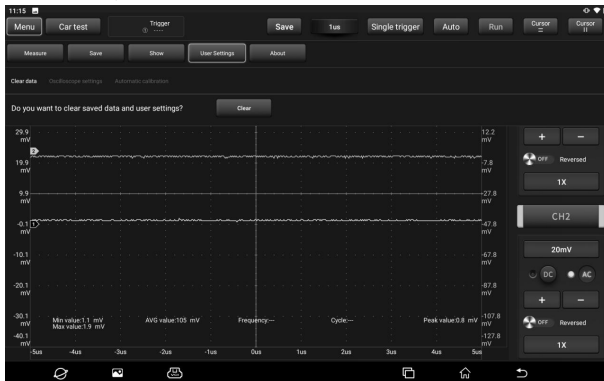
Option Description:

Menu Option	Description/Settings
Clear Data	Clear the saved data and user settings.
Oscilloscope Settings	Users can use the "Save" function to save the system setting parameters. The "Restore" function allows users to call the previously saved system settings to avoid duplicate settings.
Automatic Calibration	Automatic calibration can optimize the oscilloscope signal path with maximum measurement accuracy.

5. About

Display the basic information of the new energy module app.

7.3.5 Car Test

There are buttons for various vehicle related test content (including Circuit, Sensor, Actuator, Communication test and Combined test) in the "Car test" option. After the user selects the test content as required, the oscilloscope will automatically set the corresponding parameters to achieve the purpose of rapid setting. After selecting the function, please perform the wiring test according to the prompt in the small box on the right.

7.3.6 Cursor Measurement

The "Cursor" option can be used to aid in the measurement. Open the cursor and place the cursor at the measurement point to read out the waveform measurement value. There are two types of cursors: horizontal cursors and vertical cursors. Horizontal cursors ▤ display horizontal lines to measure vertical parameters, and vertical cursors ▥ display vertical lines to measure horizontal parameters. Click cursor option ▤/▥, and two horizontal Y1&Y2 / vertical cursor X1&X2 measuring lines will appear on the page. Click the relevant line and drag to move the line position. Click the "Cursor" option again, the function will be disabled and the auxiliary line will disappear.
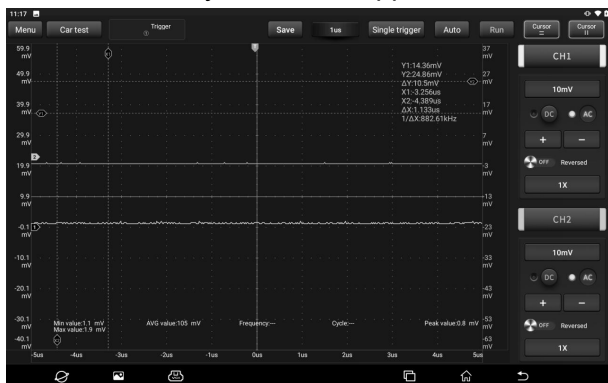
Notes:

△Reading: Indicates the difference between two cursor positions.

Voltage reading after Y1 and Y2: Indicates the position of the activated cursor relative to the current channel identification point in the horizontal cursor.

Time reading after X1 and X2: Indicates the position of the activated cursor relative to the trigger point in the vertical cursor.

1/△X: frequency.

7.3.7 Quick Save

The "Quick save" option can quickly save the measurement waveform of the currently opened channel. The oscilloscope can save the waveform of the analog channel or the mathematical channel locally. The file type can be WAV or CSV. The oscilloscope provides 2 reference channels, which can load WAV type files into the reference channel through calling, and open the reference channel to display the reference waveform. The relevant settings can be found in the "Menu".

7.3.8 REF (Reference) Waveform

The oscilloscope provides REF channel for displaying reference waveform. Users can load the previously saved waveform file into the reference channel by calling and compare it with the actual waveform to find out the difference.

1. If the previous waveform file is saved in R1, click the button under "R1 reference waveform" as shown in the figure below to call up the saved waveform list (the operation of "R2 reference waveform" is the same as R1).

2. Click the reference waveform to be viewed to display the waveform on the screen. Click the blank area of the screen to

hide the reference waveform list.

3. Click the **ON/OFF** button to display/hide the reference waveform.

8. Multimeter

This function module is used to measure voltage, current, resistance, diode and on-off condition. It can judge whether the device is good or bad and whether the circuit is complete only by simple measurement.

8.1 Technical Parameters

DC Voltage:

Automatic range, test range: ±600V

AC Voltage:

Automatic range, test range: ±600V

DC Current:

Automatic range, test range: ±10A (external sensors are required for large range currents).

AC Current:

Automatic range, test range: ±10A.

Average value measurement (external sensors are required for large range currents).

Resistance:

Automatic range, test range: 0Ω~6MΩ

Diode:
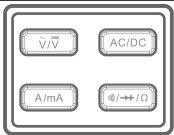
0~2.0V

On-off detection:

Sound when it is lower than 30Ω

8.2 How to Operate

The P03 host is equipped with a multimeter function button area. In addition to operating through the screen touch button, you can also set and control the multimeter function module through the buttons in the function button area.

Button Position	Button Identification	Button Description
$\widetilde{V}/\overline{\overline{V}}$	AC Voltage/DC Voltage
AC/DC	AC Current/DC Current
A/mA	
〽/→+/Ω	On-off/Diode/Resistor

First, prepare the red and black multimeter test leads needed for measurement, and find the multimeter measurement port on the top of the host at the back.
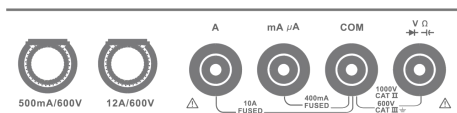
Different measurement objects have different connection methods. Please refer to the following connection methods for measurement.

8.2.1 Voltage Measurement

The connection method for measuring DC voltage is the same as that for measuring AC voltage.

1. Tap **Multimeter** on the main interface or click the "Multimeter" function switch button in the upper right corner of the host to access the following page.
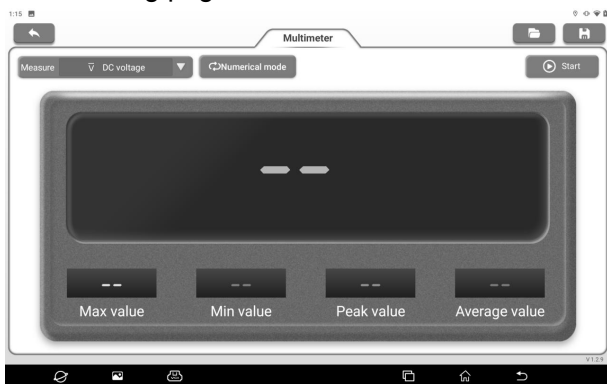
2. Select "DC Voltage" or "AC Voltage" and the corresponding range.

3. Insert one end of the black multimeter test lead into the "COM" end and one end of the red multimeter test lead into the "V/Ω" end.

4. Connect the black and red test leads to the tested point. Keep contact stable.

Option Description:

Numerical waveform mode: Display the measurement results in the form of numerical value and waveform.
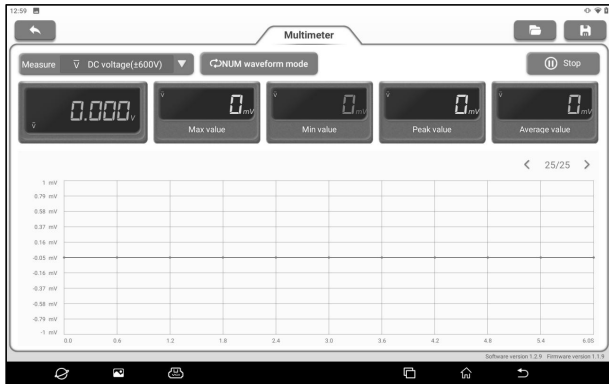
Numerical mode: Display the measurement results in numerical mode.

Waveform mode: Display the measurement results in waveform mode.
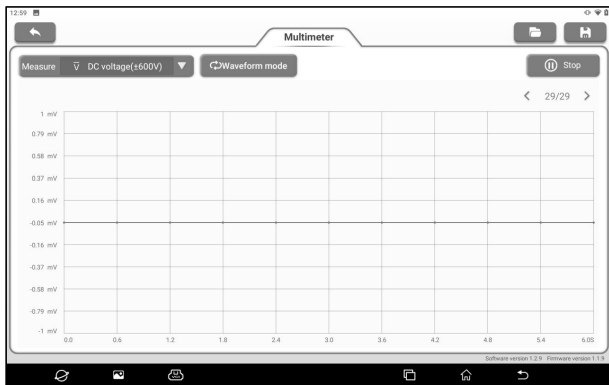
⬜: Open the saved waveform file.

🖫: Save the measurement results of the current screen as a waveform file.

5. Tap **Start**, and the value will be directly displayed on the screen.

⚠️ *Warning: The head of the multimeter test lead is metal. During the measurement, do not touch it with hands, otherwise it will not only affect the measurement results, but also may cause electric shock.*

8.2.2 Current Test

The connection methods for measuring DC current and AC current are the same.

1. Tap **Multimeter** on the main interface or click the "Multimeter" function switch button on the upper right corner of the host.
2. Select "DC current" or "AC current" and the corresponding range.
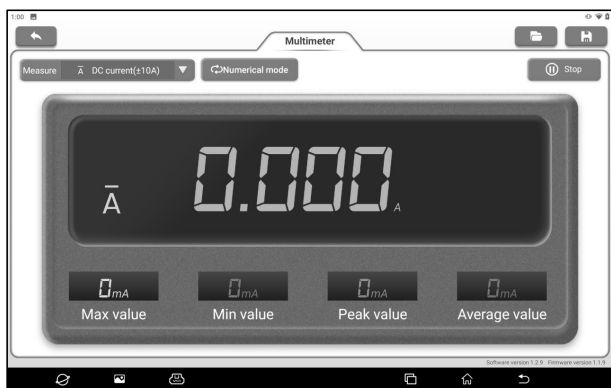
3. Insert one end of the black multimeter test lead into the "COM" end. If the current is greater than 400mA, insert one end of the red multimeter test lead into the "A" end. If the current is less than 400mA, insert one end of the red multimeter test lead into "mA µA" end.
4. Connect the black and red test leads to the tested point. Keep

contact stable.

5. Tap **Start**, and the value will be directly displayed on the screen.

8.2.3 Resistance Measurement

1. Tap **Multimeter** on the main interface or click the "Multimeter" function switch button on the upper right corner of the host.

2. Select "Resistance".

3. Insert one end of the black multimeter test lead into the "COM" end and one end of the red multimeter test lead into the "V/Ω" end.

4. Connect the black and red test leads to the metal parts at both ends of the resistance. Keep the contact between the pen and the resistance stable.

5. Tap **Start**, and the value will be directly displayed on the screen.

6. Click 🖫 button to save the measurement results.

📑 Notes: During the measurement, you can touch the resistance by hand, but do not touch both ends of the resistance at the same time, which will affect the measurement accuracy.

8.2.4 Diode Measurement

The multimeter can also measure light emitting diodes and rectifying diodes. The multimeter pen position is the same as the voltage measurement.

1. Tap **Multimeter** on the main interface or click the "Multimeter" function switch button on the upper right corner of the host.

2. Select "Diode".

3. Insert one end of the black multimeter test lead into the "COM" end and one end of the red multimeter test lead into the "V/Ω" end.

4. Connect the red test lead to the positive electrode of the diode and the black test lead to the negative electrode. Keep the contact between the pen and the diode stable.

5. Tap **Start**, and the forward conduction voltage reading of the diode will be directly displayed on the screen.

6. Click 🖫 button to save the measurement results.

8.2.5 On-off Measurement

1. Tap **Multimeter** on the main interface or click the "Multimeter" function switch button on the upper right corner of the host.

2. Select "ON/OFF".

3. Insert one end of the black multimeter test lead into the "COM" end and one end of the red multimeter test lead into the "V/Ω" end.

4. Connect the red and black test leads to the tested point.

5. Tap **Start**, and the reading will be directly displayed on the screen.

8.3 Detection Examples

Detection of knock sensor

(1) Detection of knock sensor resistance

Turn the ignition switch to the "OFF" position, disconnect the lead connector of the knock sensor, and detect the resistance between the knock sensor connecting terminal and the housing via resistance measurement, which should be ∞ (non-conductive). If it is 0Ω (conductive), the knock sensor must be replaced. For magnetostrictive knock sensor, the resistance measurement can also be used to detect the coil resistance. The resistance value shall meet the specified value (Refer to the maintenance manual of the corresponding model for specific data). Otherwise, the knock sensor must be replaced.

(2) Inspection of knock sensor output signal

Unplug the connecting plug of the knock sensor and check the voltage between the knock sensor connecting terminal and the grounding with the "AC voltage" measuring gear when the engine is idling. There should be pulse voltage output. If not, the knock sensor must be replaced.

Detection of cooling water temperature sensor

(1) Resistance detection of cooling water temperature sensor

On-vehicle inspection: Turn the ignition switch to OFF position, remove the cooling water temperature sensor wire connector, and test the resistance value between the two terminals of the sensor via resistance measurement. The resistance value is inversely proportional to the temperature (negative temperature coefficient), and shall be less than 1KΩ when the engine is hot.

Single piece inspection: Unplug the cooling water temperature sensor wire connector, and then remove the sensor from the engine. Place the sensor in the water in the beaker, heat the water in the beaker, and measure the resistance value between the two terminals of the water temperature sensor under different water temperature conditions via resistance measurement. Compare the measured value with the standard value. If it does not meet the standard, the water temperature sensor should be replaced.

(2) Output signal voltage detection of cooling water temperature sensor

Install the cooling water temperature sensor and plug the wire connector of the sensor. When the ignition switch is turned to the ON position, test the sensor output voltage signal from the two terminals of the water temperature sensor wire connector. The measured voltage value shall change inversely with the

cooling water temperature. When the cooling water temperature sensor harness is disconnected and the ignition switch is turned on, the voltage should be about 5V.

8.4 Precautions

1. The head of the multimeter test lead is metal. Do not touch it with hands during measurement, otherwise it will not only affect the measurement results, but also cause electric shock.
2. Before the measurement, calibrate the measuring range and the jack inserted by the test lead, and then carry out the measurement after there is no error.
3. If the measured value cannot be estimated before measurement, the highest range shall be used for measurement first, and then the appropriate range shall be selected according to the measurement results.
4. It is strictly prohibited to switch the range when measuring high voltage or large current to prevent arcing and burning the switch contacts. To shift gears, the metal contacts must be disconnected first.
5. It is strictly prohibited to measure the resistance when the circuit under test is live to avoid damaging the instrument.
6. When measuring DC power, select appropriate gear. For different components, the current is different. You can refer to the marked parameters of components to switch gears. During measurement, it is connected to the circuit in series, and then measured one by one. The voltage of the branch can be disconnected first. In particular, it is forbidden to connect the multimeter in parallel in the circuit, which will not only damage the multimeter but also cause casualties.

9. Insulation Test

This function module is mainly used to measure the insulation resistance of electrical equipment, and help automobile maintenance technicians to check and find the short circuit and electric shock risks that may be caused by the deterioration of insulation performance of automobile electronic equipment and circuits.

📝 Notes: Automobile maintenance technicians must wear insulating gloves during insulation test. Operating insulation test without protection may cause serious electric shock.

9.1 Technical Parameters

Output Voltage:
500V/1000V/2500V/5000V

Insulation Resistance:
500V: 1MΩ ~ 20MΩ
1000V: 1MΩ ~ 40GΩ
2500V: 5MΩ ~ 100GΩ
5000V: 10MΩ~ 1000GΩ

Short Circuit Current:
<3.0mA

DC Voltage:
±30~±600V DC; Resolution 1V; Accuracy: ±2%

AC Voltage:
30~600V AC; Resolution 1V; Accuracy: ±2%

Display Mode:
Segment code display, USB upload data is displayed and recorded on the diagnostic device
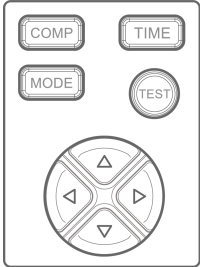
9.2 Precautions

- Before measuring the insulation resistance, please disconnect the power supply of the equipment and discharge all high-voltage capacitors.
- When performing insulation measurement, do not touch the line to be tested and the conductive part of the test clip.

- Select a suitable range for measurement according to the parameters of the equipment to be tested.
- Release the charge in the circuit to be tested after completing the measurement. Tap **Close the measurement** button on the screen or the TEST button in the function button area, and then remove the test clip after the screen prompts "Measurement closed".

9.3 How to Operate

The P03 main unit is equipped with the insulation test function button area. In addition to operating through the screen touch button, you can also set and control the insulation test function module through the buttons in the function button area.

Button Position	Button Identification	Button Description
	COMP	Click to enter the "Comparative measurement" mode.
	TIME	Click to switch between "Timing measurement" and "Continuous measurement".
	MODE	Click to switch between "Resistance measurement", "DC Voltage measurement" and "AC Voltage measurement".
	TEST	Control the start and end of the measurement when "Resistance measurement" is performed.
	△▽ **Up And Down Direction Buttons**	Adjust the value of "Output voltage".
	◁▷ **Left And Right Direction Buttons**	**Comparative measurement mode**: Adjust the value of "Comparative resistance value".

| | | **Timing measurement mode**: Adjust the value of "Measurement time". |

First, prepare the insulation test clip required for measurement, and find the measurement port for insulation test on the right side of the main unit.
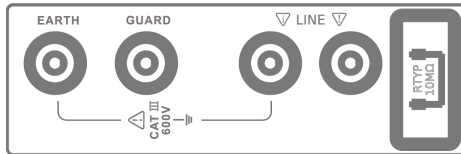
9.3.1 Resistance Measurement

1. Tap **Insulation Test** on the main interface or click the "insulation test" function switch button on the upper right corner of the host to access the following page.
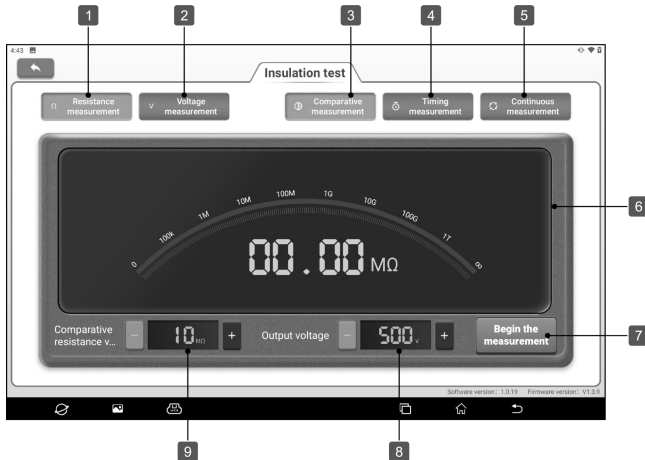
No.	Description	Operation Prompt
1	**Resistance measurement**	Click to switch to "Resistance measurement".
2	**Voltage measurement**	Click to switch to "Voltage measurement", and there are two options of "DC voltage" and "AC

		voltage".
3	**Comparison measurement**	Click to switch to "Comparison measurement".
4	**Timing Measurement**	Click to switch to "Timing measurement".
5	**Continuous Measurement**	Click to switch to "Continuous measurement".
6	**Measurement Result Display Area**	
7	**Begin the Measurement/Close the Measurement**	Click "Begin the measurement" and click "Close the measurement" after the measurement is completed.
8	**Output Voltage Regulation**	Click "-" to reduce the voltage value, and click "+" to increase the voltage value.
9	**Comparison Resistance Adjustment**	Click "-" to reduce the resistance value, and click "+" to increase the resistance value.

2. Tap **Resistance Measurement** or use the MODE button to switch to "Resistance measurement" mode.

3. Insert one end of the red insulation test clip into the "LINE" port and connect the other end to the high-voltage conductor of the equipment to be detected. Insert one end of the green insulation test clip into the "EARTH" port, and connect the other end to the equipment housing or ground. Insert one end of the black insulation test clip into the "GUARD" port and connect the other end to the high-voltage grommet of the equipment to be detected.

Notes: It is forbidden to short circuit the LINE end and the GUARD end to avoid overload.

4. There are three measurement methods for Resistance measurement: Comparison measurement, Timing measurement and Continuous measurement.

Comparison Measurement

1) Tap **Comparison Measurement** or click the COMP button in the function button area.

2) Click -/+ or the left and right direction buttons in the function button area to set the comparison resistance value, click -/+ or the up and down direction buttons in the function button area to set the output voltage value, and then **tap Begin the Measurement** or long press the TEST button to start measurement.

3) After the measurement is completed, the screen will display the measured resistance value. If the measured resistance value is not less than the set comparison resistance value, the upper right corner of the screen will display "GOOD". If the measured resistance value is less than the set comparison resistance value, the upper right corner of the screen will display "NG".
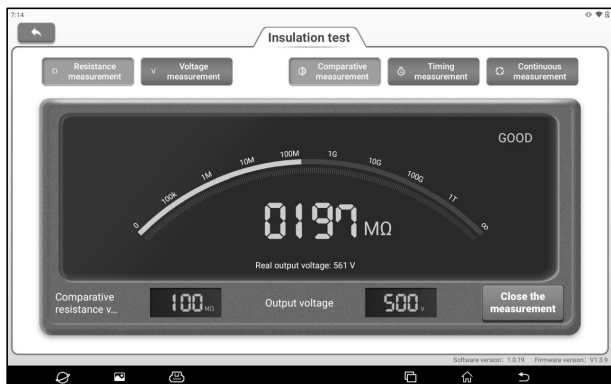
4) Tap **Close the Measurement** or click TEST again to end measurement.

Timing Measurement

1) Tap **Timing measurement** or switch to "Timing measurement" through the TIME button in the function button area.

2) Click -/+ or the left and right direction buttons in the function button area to set the measurement duration, click -/+ or the up and down direction buttons in the function button area to set the output voltage value, and then tap **Begin the Measurement** or long press the TEST button to start measurement.

3) After the measurement is completed, the screen will display the measured resistance value.

Continuous Measurement

1) Tap **Continuous Measurement** or switch to "Continuous measurement" through the TIME button in the function button area.

2) Click -/+ or the up and down direction buttons in the function button area to set the output voltage value, and then tap **Begin the Measurement** or long press the TEST button to start measurement.
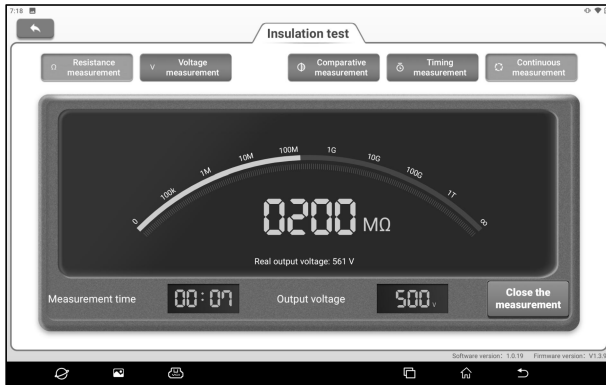
3) Tap **Close the Measurement** or click the TEST button again to end the measurement, and the measured resistance value and measurement duration will be displayed on the screen.

9.3.2 Voltage Measurement

1. Tap **Voltage Measurement**, and then select "DC voltage" or "AC voltage" according to the type of power supply to be measured. You can also switch to the required option through the MODE button.

2. Insert one end of the red insulation test clip into the "LINE" port and connect the other end to the positive electrode of the power supply to be tested. Insert one end of the green insulation test clip into the "EARTH" port and connect the other end to the negative electrode of the power supply to be tested.

3. The screen will display the measured voltage value.

10. Current Clamp

This function module needs to be used with new energy current clamp equipment, and can be used to conduct AC/DC current test and DC voltage test.

10.1 Current Clamp Host
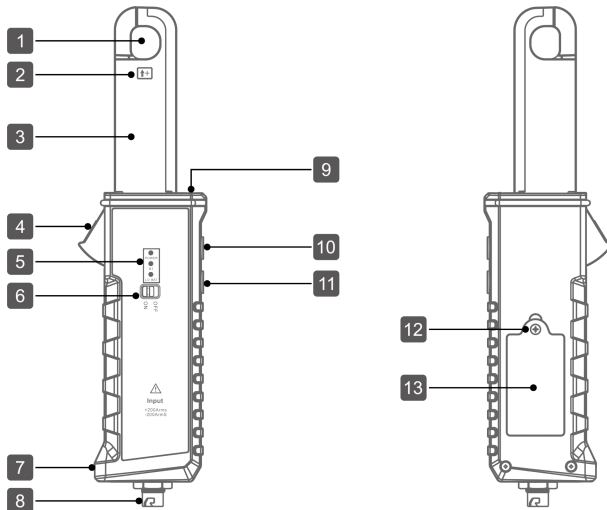
1. Jaw

φ16mm×18mm

2. Direct current positive input indication

3. Clamp Mouth

4. Trigger

Control opening and closing of clamp head

5. Indicator

Power: Power indicator. It illuminates after power-on.
BT: Bluetooth indicator. It flashes when communicating with diagnostic equipment.
LO BAT: Battery indicator. It illuminates when the battery is low.

6. Power Switch

7. Rope Chain Hole

8. Aviation Socket

9. Illuminating Lamp

10. Illuminating Lamp Switch

11. ZERO Button

When measuring DC current, zero adjustment shall be conducted

before measurement.

12. Fixing Screws of Battery Cover

13. Battery Cover

10.2 Technical Parameters

Battery:

9V dry battery

Test Mode:

Clamp CT, non-contact measurement

Jaw Size:

φ16mm×18mm (outer diameter of clampable wire)

Input Range:

0~200A AC/DC

Resolution:

1mA AC/DC

Accuracy:

±3%FS (23℃±5℃, below 75%rh)

Zero Adjustment:

The ZERO button can be used for zero adjustment to eliminate the interference of geomagnetic field and external electric field.

Frequency Response:

DC～50kHz

Voltage Test:

±48V DC

10.3 Operation

1. Tap **Current Clamp** on the main interface or click the "Current Clamp" function switch button to access the following page.
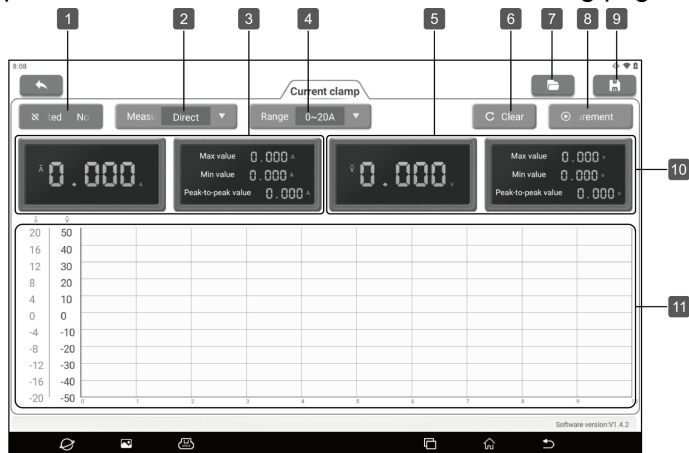
No.	Description	Operation Prompt
1	**Bluetooth Button** Set current clamp bluetooth connection and view bluetooth connection status	Click to search for and select devices to connect, and "connected" will be displayed after connecting.
2	**Measurement type**	Click the drop-down list to select the measurement type: AC or DC.
3	**Current measurement value display bar**	
4	**Range selector**	Click the drop-down list to display the ranges, including 0 ~ 20A and 0 ~ 200A.
5	**Voltage measurement value display bar**	
6	**Zero**	Click to zero the current clamp. This function is the same as the **ZERO** button on the current clamp.
7	**Open waveform**	Playback of previously saved waveforms.
8	**Start/stop**	Click to start/end measurement.
9	**Save waveform**	Click to save the current waveform.

2. Turn on the power switch on the current clamp, and the power indicator lamp will be on.

3. Click the "not connected" button on the screen to start searching for the current clamp. Click the Bluetooth name of the current clamp to be connected (the Bluetooth name is the serial number of the current clamp device) to connect. After the connection is successful, the screen will display "connected".

4. Ensure that the current clamp is not in use. Press the [ZERO] button on the current clamp until the reading on the screen is 0.

📝 *Notes: The effect of external electric field or geomagnetic field on the current clamp can be eliminated by using the zeroing function reasonably to make the measured value more accurate. Zeroing steps: Firstly, put the clamp head close to the measured wire, and the current clamp induction will output a voltage (the interference amount of the external electric field). Adjust the ZERO button to zero the interference amount, and then clamp the measured wire, so that the test data will be more reliable.*

After measuring the large current, the current clamp will have a certain amount of residual magnetism in a short time. If it is used for the small current test immediately, perform zeroing again.

5. Press the trigger to open the clamp head, clamp the wire to be measured and tap **Start measurement** button on the screen to measure.

6. When measuring the voltage, insert one end of the current clamp test clip into the aviation socket of the current clamp, and clamp the positive and negative cables of the power supply to be tested at the other end, and then conduct the measurement.

10.4 Specific Application

When measuring DC current

Measure DC leakage: Clamp the positive and negative wire of the DC line at the same time.
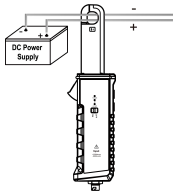
Measure the current of the main line:
Only clamp the main wire of the main line.
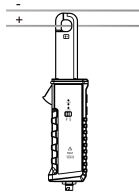
Measure the leakage current of the ground wire:
Only clamp the ground wire.
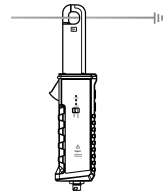
When measuring AC leakage

Clamp the live wire and neutral wire of the AC line at the same time
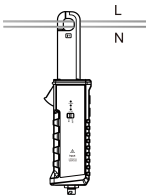
When measuring DC voltage

Connect one end of the current clamp test clip to the aviation socket of the current clamp, and clamp the positive and negative cables of the power supply to be tested at the other end.
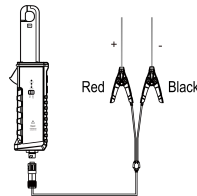
10.5 Battery Replacement

When the battery is low, the LO BAT indicator on the current clamp will be on. Please shut down and replace the battery in time. Use a cross screwdriver to open the battery cover when installing the battery. Pay attention to the polarity of the battery to avoid damaging the current clamp. Please use 9V dry battery for replacement. When the current clamp is not used for a long time, take out the battery.

11. Special Functions

This module provides the quick entry for commonly used special function operation, including A/F Reset, Brake Reset, maintenance lamp returns to zero, steering angle learning, battery replacement, ABS exhaust, throttle learning, tire pressure reset, DPF regeneration, wave case learning, gear learning, headlamp matching, electronic water pump start, engine power balance, anti-theft matching, high pressure accumulator health detection, GPF regeneration and release of transport mode etc. If you need to operate more special functions, you can enter the diagnostic model software to operate。

Note: The specific special functions provided depend on the vehicle type.

11.1 A/F Reset

This function is applied to set or learn Air/Fuel ratio parameters.

11.2 Electronic Parking Brake Reset

This function enables you to reset the brake pad after replacing the brake pad.

It needs to be performed in the following cases:

1) The brake pad and brake pad wear sensor are replaced.

2) The brake pad indicator lamp is on.

3) The brake pad sensor circuit is short, which is recovered.

4) The servo motor is replaced.

11.3 Oil Reset Service

If the service lamp is on, run car diagnostics first for troubleshooting. After that, reset the driving mileage or driving time, so as to turn off the service lamp and enable a new driving cycle.

11.4 Steering Angle Calibration

This function enables you to reset the steering angle, after replacing the steering angle position sensor, replacing steering mechanical parts (such as steering gearbox, steering column, end tie rod, steering knuckle), performing four-wheel alignment, or recovering car body.

11.5 Battery Maintenance System Reset

This function enables you to perform a resetting operation on the monitoring unit of vehicle battery, in which the original low battery fault information will be cleared and battery matching will be done.

It needs to be performed in the following cases:

1) The main battery is replaced.

2) The battery monitoring sensor is replaced.

11.6 ABS Bleeding

This function allows you to perform various bi-directional tests to check the operating conditions of Anti-lock Braking System (ABS).

It needs to be performed in the following cases:

1) When the ABS contains air.

2) When the ABS computer, ABS pump, brake master cylinder, brake cylinder, brake line, or brake fluid is replaced.

11.7 Throttle Learning

This function enables you to make initial settings to throttle actuators and returns the learned values stored on ECU to the default state. Doing so can accurately control the actions of regulating throttle (or idle engine) to adjust the amount of air intake.

Cases when throttle learning is required:

1) After the replacement of the ECU, the ECU does not store the characteristics related to the working of the throttle, so the throttle matching is required.

2) After the power-off of the ECU, the memory of the ECU memory is lost, and throttle matching is required.

3) After replacing the throttle assembly, the throttle matching is required.

4) After the replacement or disassembly of the inlet, the coordination of the ECU and throttle body on the idle speed control will be affected, and the throttle matching is required.

5) After cleaning the throttle, the characteristics of the idle throttle potentiometer have not changed, but under the same throttle opening, the air intake has changed, and the idle control characteristics have changed. At this time, it is necessary to match the throttle.

11.8 Tire Pressure Monitor System Reset

This function enables you to quickly look up the tire sensor IDs from the vehicle's ECU, reset tire pressure and turn off the tire pressure MIL.

It needs to be performed in the following cases:

Tire pressure is too low, tire leaks, tire pressure monitoring device is replaced or installed, tire is replaced, tire pressure sensor is damaged, and tire is replaced for the car with tire pressure monitoring function.

11.9 Diesel Particulate Filter (DPF) Regeneration

This function enables you to clear PM (Particulate Matter) from the DPF filter through continuous combustion oxidation mode (such as high temperature heating combustion, fuel additive or catalyst reduce PM ignition combustion) to stabilize the filter

performance.

It needs to be performed in the following cases:

1) The exhaust back pressure sensor is replaced.

2) The PM trap is removed or replaced.

3) The fuel additive nozzle is removed or replaced.

4) The catalytic oxidizer is removed or replaced.

5) The DPF regeneration MIL is on and maintenance is performed.

6) The DPF regeneration control module is replaced.

11.10 Gearbox Matching

This function enables you to complete the gearbox self-learning to improve gear shifting quality.

It needs to be performed in the following cases:

When the gearbox is disassembled or repaired.

11.11 Gear Learning

This function enables you to perform tooth learning for the car, to turn off the MIL.

It needs to be performed in the following cases:

1) After the engine ECU, crankshaft position sensor, or crankshaft flywheel is replaced.

2) The DTC 'tooth not learned' is present.

11.12 Motor Angle Calibration

When the rotor position detected by the motor angle position sensor is different from the actual rotor field position, motor angle calibration must be performed.

11.13 Coolant Bleed

Use this function to activate the electronic water pump before venting the cooling system.

11.14 Engine Power Balance Monitoring

It is used to monitor crankshaft acceleration in the power stroke of each cylinder, to determine the relative power provided by each cylinder.

11.15 IMMO Prog

This function supports the reading and writing of car key chip, EEPROM chip, MCU chip, EEPROM and flash of engine ECU and transmission ECU.

11.16 IMMO Service

This function enables you to perform the anti-theft key matching function, so that the immobilizer control system on the car identifies and authorizes remote control keys to normally use the car.

It needs to be performed in the following cases:

When the ignition switch key, ignition switch, combined instrument panel, ECU, BCM, or remote control battery are replaced.

11.17 High Voltage Battery Diagnosis

It is used for high voltage battery diagnosis and status information detection.

11.18 Gas Particulate Filter Regeneration

After the GPF is used for a long time, fuel consumption is increased and engine output power is reduced. In this case, the

GPF replacement or regeneration must be performed.

11.19 Transport Mode

In order to reduce power consumption, the following functions may be disabled, including limiting the vehicle speed, not waking up the door opening network, and disabling the remote control key, etc. At this time, the transport mode needs to be deactivated to restore the vehicle to normal.

11.20 Tire Reset

This function is used to set the size parameters of the modified or replaced tire.

11.21 Windows Calibration

This feature is designed to perform door window matching to recover ECU initial memory, and recover the automatic ascending and descending function of power window.

11.22 AdBlue Reset

After the diesel exhaust treatment fluid (car urea) is replaced or filled up, urea reset operation is required.

11.23 NOx Sensor Reset

NOx sensor is a sensor used to detect the content of nitrogen oxides (NOx) in engine exhaust. If the NOx fault is re-initialized and the NOx catalytic converter is replaced, it is necessary to reset the catalytic converter learned value stored in the engine ECU.

11.24 Injector Coding

This function enables you to write injector actual code or rewrite code in the ECU to the injector code of the corresponding cylinder,

so as to more accurately control or correct cylinder injection quantity.

It needs to be performed in the following cases:

After the ECU or injector is replaced.

11.25 Stop/Start Reset

This function is used to open or close the automatic start-stop function via setting the hidden function in ECU (provided that the vehicle has a hidden function and supported by hardware).

11.26 Sunroof Initialization

This function enables you to set the sunroof lock off, closed when it rains, sliding / tilting sunroof memory function, temperature threshold outside the car etc.

11.27 Suspension Calibration

This function enables you to adjust the height of the body.

It needs to be performed in the following cases:

1) When replacing the body height sensor, or control module in the air suspension system.

2) When the vehicle height is incorrect.

11.28 Language Change

This function is used to change the system language of the vehicle central control panel.

11.29 Intelligent Cruise Control System Diagnosis

It is used for matching after the intelligent cruise control module is replaced or repaired.

11.30 AC System Relearn/Initialization

AC system relearn/ initialization must be performed when the vehicle AC ECU or actuator is replaced or the ECU memory is lost.

11.31 Seats Calibration

This function is applied to match the seats with memory function that are replaced and repaired.

11.32 AFS (Adaptive Front-lighting System) Reset

This function can be used to initialize the adaptive headlamp system. The adaptive headlamp system can decide whether to turn on the headlamp automatically according to the environmental light intensity, and monitor the vehicle's speed and body posture, and adjust the lighting angle of the headlamp timely.

11.33 Compressor Test

This function is used for testing after replacement and maintenance of vehicle compressor.

11.34 Coolant Change

The performance of the coolant deteriorates during normal use and the coolant needs to be changed within a certain period. This function is used to guide and explain the coolant change process.

11.35 EGR Learning

This function is used for learning after EGR (Exhaust Gas Recirculation) valve cleaning or replacement.

12. ADAS Calibration

The ADAS calibration function is used to calibrate driver assistance systems with various cameras and radars, such as front-facing cameras for lane departure warning systems, and radar sensors for ACC (Adaptive Cruise Control), etc.

12.1 Activate ADAS Calibration Function

The ADAS calibration function on the device is disabled by default. Users need to use the activation card to activate the function before using it. This function is available with the specified ADAS calibration tool (purchased separately).

Perform the following steps to activate the device:

(1) Tap **ADAS Calibration** on the main interface, and the following prompt box will pop up. Tap **Activate** to enter the ADAS activation page.
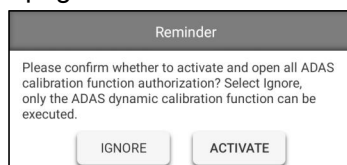
(2) Tap **Activate** on the ADAS activation page.
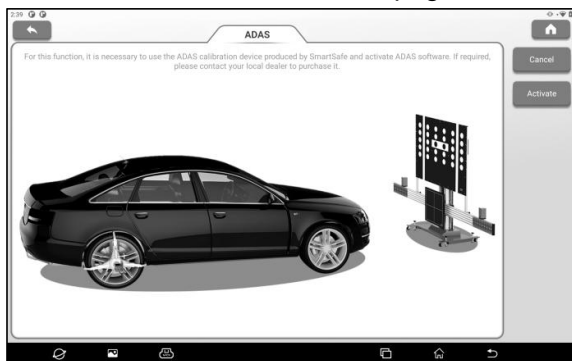
(3) Scrape the coating area of the ADAS activation card to display the activation code. Enter the 24-digit activation code, and then tap **Activate** to activate the ADAS function.

(4) After successful activation, the calibration function of ADAS can be used normally.

12.2 Start Calibration

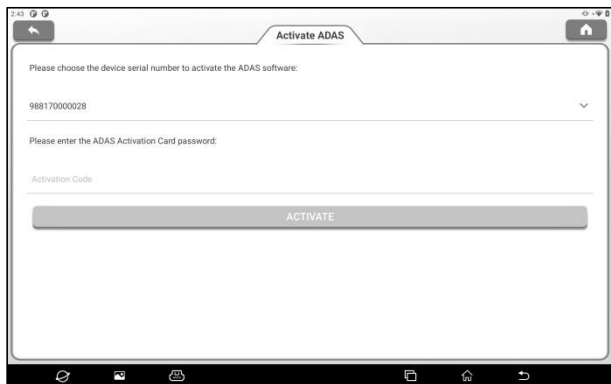Users need to perform the calibration as prompted on the host. The ADAS calibration function is introduced through the ADAS demo program as follows.

Note: Before performing the ADAS calibration operation, make sure that the VCI connector is connected to the vehicle diagnosis seat and the Bluetooth communication between it and the host is normal.

12.2.1 ADAS System Selection

Use this function to select the ADAS system that requires ADAS calibration.
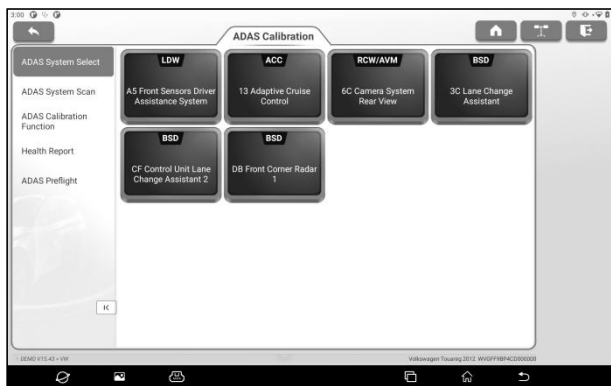
12.2.2 ADAS System Scan

Use this function to scan which ADAS systems are installed on the test vehicle.
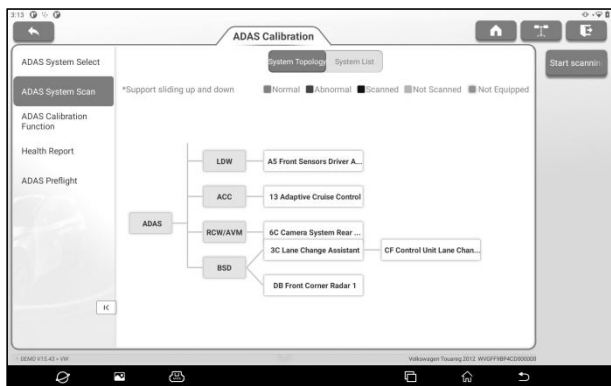
The ADAS system supports two display modes: System Topology and System List. Tap **Start Scanning** to scan the ADAS system one by one. After scanning is completed, click the system displayed in red (the system is displayed in red, indicating that there is a fault code in the system) to view the fault code, and click the system that works normally (the system is displayed in green, indicating that the system works normally) to perform other

diagnostic functions.

12.2.3 ADAS Calibration Function

Users can use this option to perform ADAS calibration operations. To perform this function, please coordinate with a calibration tool such as ADAS Mobile or ADAS PRO+. The calibration tool is used to locate the calibration target, and the tablet is used to guide the user on how to position the calibration tool and provide detailed calibration steps.

Tap **ADAS Calibration Function** to enter the following page:
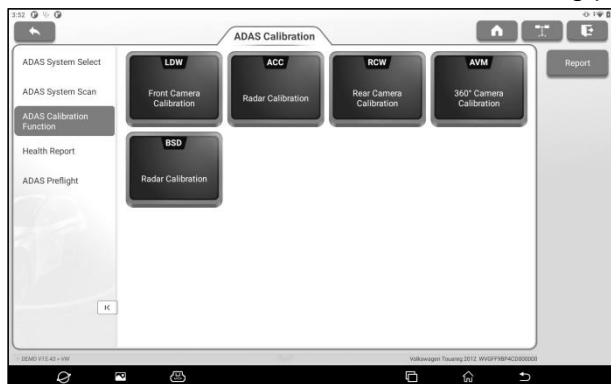
Click the item to be calibrated and then follow the instructions on the screen to perform the calibration function.

After the calibration is complete, a prompt box will pop up on the screen asking whether to save the ADAS report.
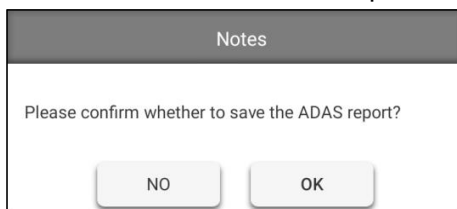
Tap **OK** to save the ADAS report. All ADAS reports are stored

under the **Other** -> **Reports** -> **ADAS Reports** tab.

12.2.4 Health Report

After the calibration of the ADAS system, use this option to perform a full vehicle scan to confirm that the vehicle fault code has been cleared.
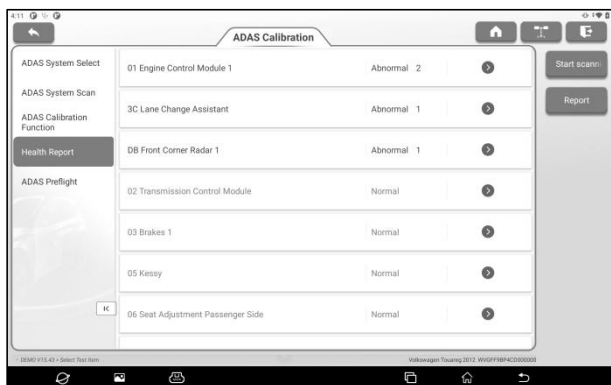
13. Remote Diagnose

The module is used to remotely assist users in diagnosis operations. Tap **Remote Diagnose** to enter the following page:
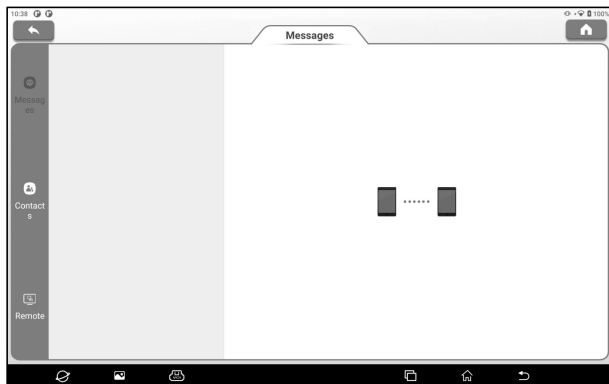
13.1 Messages

Tap **Messages** to enter the messages page, here you can see all the messages received.
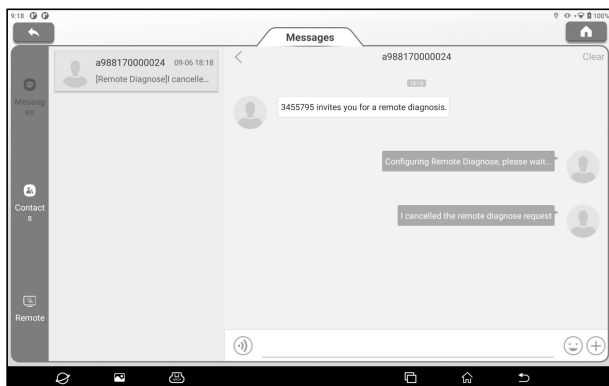
13.2 Contacts

Tap **Contact** to enter the following page. Here you can see the

contact list including maintenance technicians and added friends.
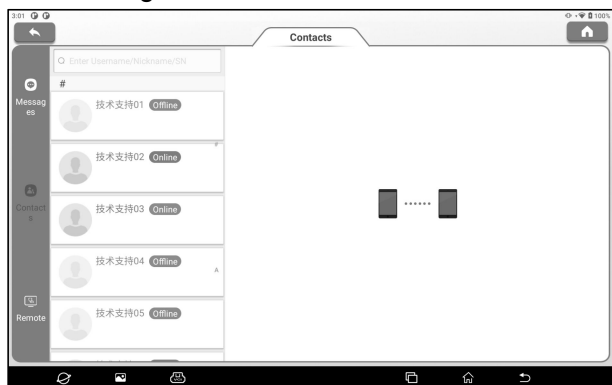
Enter "Username/Nickname/Serial Number" in the search bar to search and add a friend. The added friends will appear in the contacts list.

Select the maintenance technician in the list to enter the interactive page. In the interactive page, you can communicate with text and voice messages, send files and pictures, invite remote diagnose assistance, etc.

13.3 Remote

Tap Remote to enter the following page.
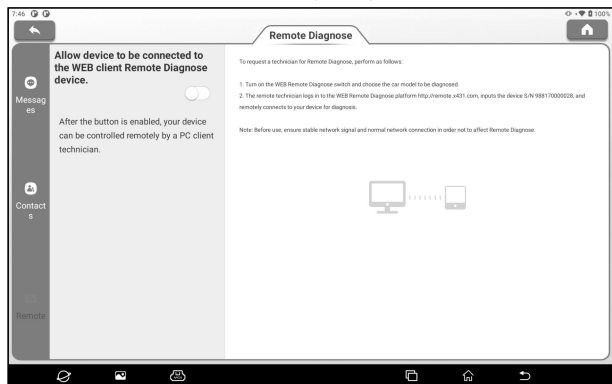
To request a technician for Remote Diagnose, please follow the below steps.

1. Turn on the WEB Remote Diagnose switch and choose the car model to be diagnosed.

2. The remote technician logs in to the WEB Remote Diagnose platform http://remote.x431.com, inputs the device S/N, and remotely connects to your device for diagnosis.

Note: Before use, ensure stable network connection in order not to affect Remote Diagnose.

14. IMMO Matching

This function enables you to perform the anti-theft key matching function, so that the immobilizer control system on the car identifies and authorizes remote control keys to normally use the car.

14.1 Anti-theft Matching

14.1.1 Vehicle Connection

1. For most vehicles, just use the included OBD II extension cable to connect the VCI to the vehicle's DLC port.
2. For other vehicles (including but not limited to the Mercedes Benz, VW, BMW and Porsche), the iSmartIMMO G3 and diagnostic main cable (optional) are required.

iSmartEV BOX

Diagnostic Main Cable
(Optional)

iSmartIMMO G3
(Optional)
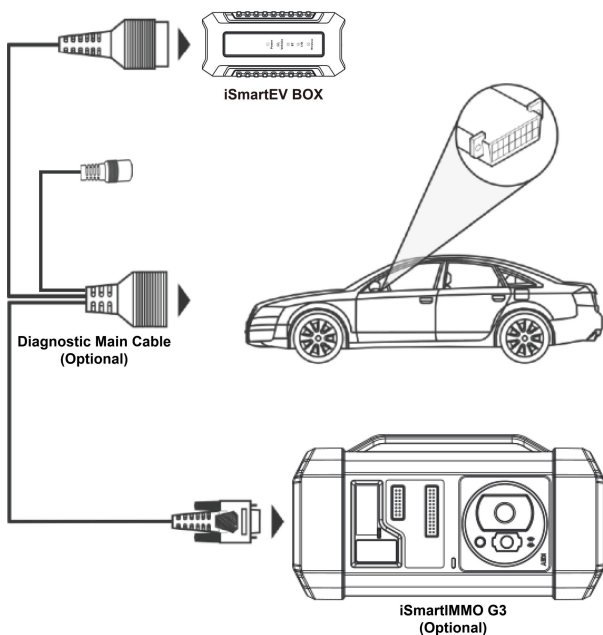
14.1.2 Operations

Here we take the BMW for example to demonstrate how to perform the functions of key adding and all lost for BMW CAS4/CAS4 + anti-theft system module.

1. Tap **IMMO Matching** on the main interface and select BMW as the vehicle brand.

2. Check that the VCI, vehicle and iSmartIMMO G3 are correctly connected according to the prompts in the software picture, and then tap **OK**.
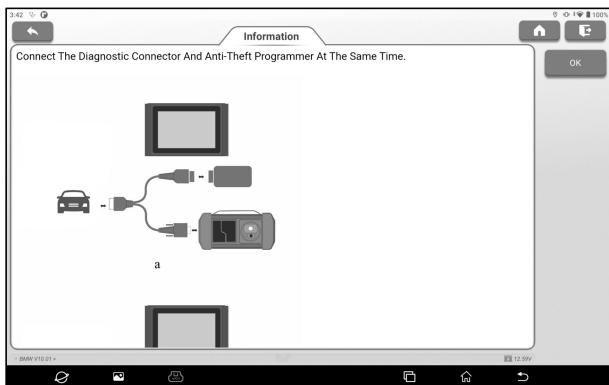
3. Tap **Anti-Theft Key Matching**.

4. Tap **CAS4/CAS4+ IMMO**. If you are not sure about the type of anti-theft system, tap **Automatic Detection**.
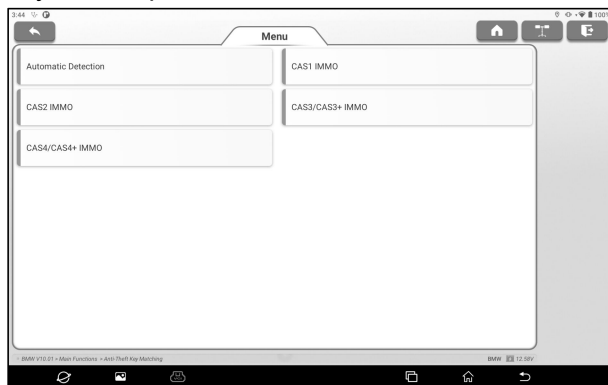
5. Tap **Preprocessing** to perform Read anti-theft data, Key matching and more. If it has already been preprocessed, here you can perform the relevant functions. The ECU will be upgraded in this process, and files need to be downloaded online.

6. After preprocessing, tap **OK**.
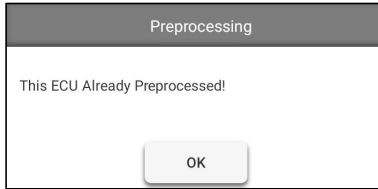
7. Return to the function menu page and tap **Key Learning**.

8. After the key information successfully read, select the unused key position and tap **Key Generated By Ignition Switch**.
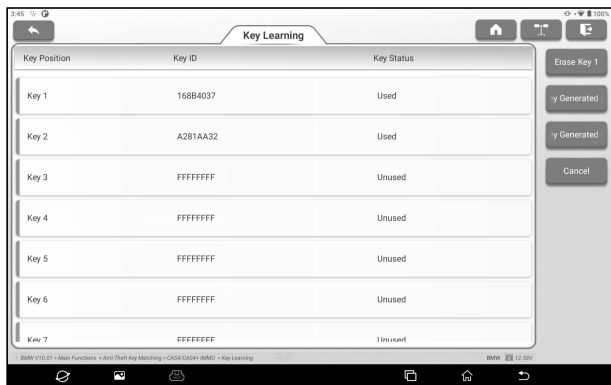
9. Read and display the password, and tap **OK**.
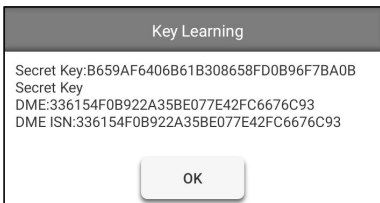
10. Place a new key close to vehicle coil, tap **OK**, and wait for key generation.
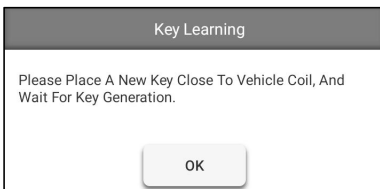
11. After the dealer key is successfully generated, please try to start the vehicle. Now the key matching is finished and the new key is ready for use.

14.2 IMMO PROG

The iSmartIMMO G3 is required when performing this operation. It has the following functions:

- Read transponder data (including Mercedes Benz infrared smart key), and generate exclusive keys.
- Read/write on-board EEPROM chip data, and read/write MCU/ECU chip data.
- Read/write remote control transponder data and detect key frequency.

1. Before performing this function, please make sure the following connections are properly made.
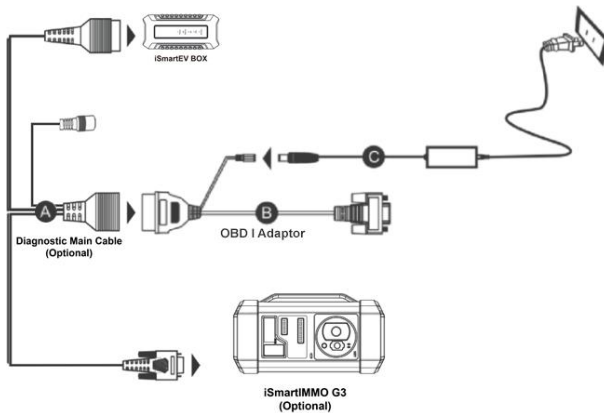
Diagnostic main cable
OBD I adaptor
Switching power supply of the iSmartIMMO G3

▣ Notes:

- *You are suggested to connect the BOX shown in above diagram to the tablet*

via the USB cable. Using a USB cable could effectively enhance your data transmission speed.

- *IMMO Programming does not require a connection to the vehicle. To ensure that the iSmartIMMO G3 works properly, ONLY use the switching power supply and OBD I adaptor to supply power to the iSmartIMMO G3. Obtaining power through a connection to the DC power jack of the iSmartIMMO G3 via the switching power supply alone is failed.*

2. Tap **IMMO Matching** on the main interface and then tap **IMMO PROG** to enter the following screen.

3. Select the desired item to proceed.

14.2.1 EEPROM Programming

This function allows you to read/write on-board EEPROM chip data.

14.2.2 Engine Programming

This function allows you to read the engine data and write in the backup data after a new engine is replaced.

Below procedures show you how to perform engine programming.

1. Tap **Engine**.

2. Select Engine Brand (e.g. Bosch).

3. Select Engine series (e.g. MED17).

4. Tap **Search For ECU Model**.
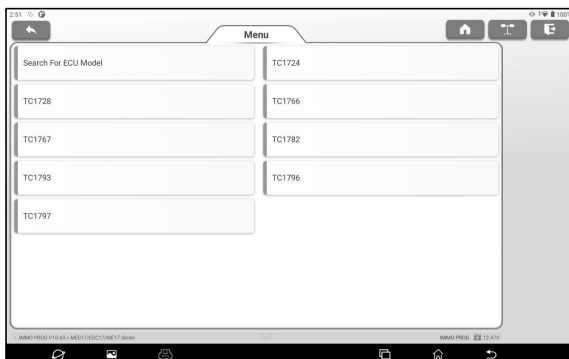
5. Check ECU model (printed on the sticker on the back of your Engine), enter the engine type in the dialogue box (for example , the engine type should be MED17.7.7) and tap **OK**.

Information
Input Engine Type (Such As MED17.1)
med17.7.7

CANCEL   OK
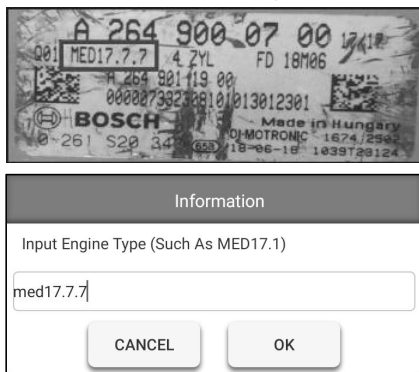
6. Tap **OK** to confirm the engine type and enter the function selection screen.

Information
The Main Control Chip Corresponding To The Current Engine Type Is: TC1793

OK
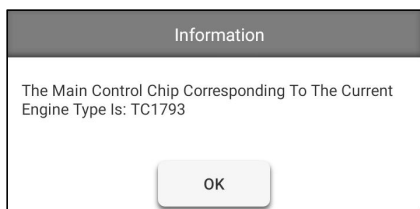
📖 Note: The function selection screen varies by different vehicle manufacturers.

a. Tap **View Wiring Diagram** to check how to connect the engine with the iSmartIMMO G3.

📖 Note: Vehicle engine connection could vary depending on engine types, for information how to connect the car engine, refer to the onscreen connection diagram.
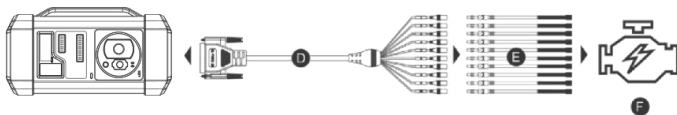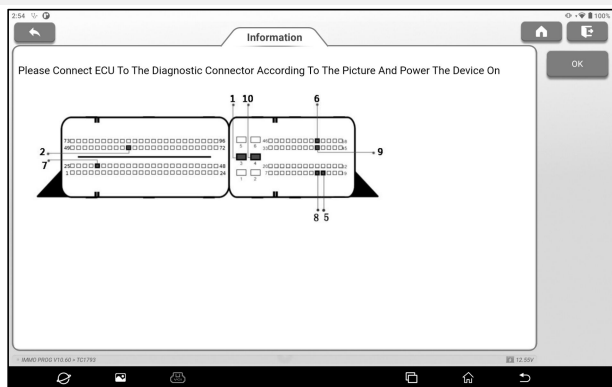
D. BENCH mode cable (optional)
E. Adaptor cable (optional) associated with the BENCH mode cable
F. Engine

b. Tap **Backup EEPROM data** to create a file name and save it on the tablet.

c. Tap **Restore EEPROM data** to write the backup EEPROM data into the new engine.

🛑 Stop: The EEPROM restoration applies only when you have encountered irrevocable faults or after a new engine is replaced.

d. Tap **Backup FLASH data** to save the FLASH data on the tablet to avoid accidents.

e. Tap **Read chip ID** to read the chip information.

14.2.3 Gearbox Programming

This function allows you to restore the old gearbox data or write in new data after a new gearbox is replaced.

Below procedures show you how to perform gearbox programming for AUDI.

There are two kinds of gearbox ECU replacements, and the user can choose the corresponding solution according to the actual situation.

Situation 1 - The data of the original vehicle gearbox ECU is readable. Data is not damaged, and the gearbox can be cloned. In this case, we just need to back up the original gearbox EEPROM and FLASH, and then restore them into the gearbox ECU for replacement.

Situation 2 - The data of the original vehicle gearbox ECU is unreadable or the data is damaged. In this case, we need to back up the EEPROM of the ECU for replacement, and then manually input the original CS code or get the original CS code from the original key.

Situation 1:

1. Tap **Gearbox**.

2. Select Gearbox type according to the specific model, here we choose **DQ200-MQB** (take this as an example) to enter the function selection screen.

⧉ Note: The function selection screen varies by different vehicle manufacturers.

3. Tap **View Writing Diagram** to check how to view the original car gearbox ECU with iSmartIMMO G3 using the BENCH mode cable and its associated adaptor cable.

⧉ Note: Vehicle gearbox connection could vary depending on gearbox types, for information how to connect the car gearbox, refer to the onscreen connection diagram.
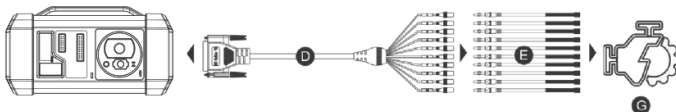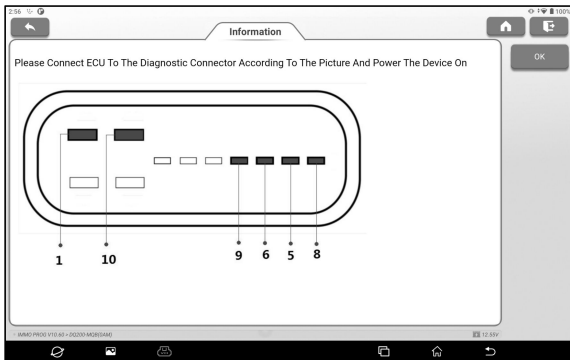
D. BENCH mode cable (optional)

E. Adaptor cable (optional) for the BENCH mode cable

G. Gearbox ECU

4. Tap **Connect** to read the chip ID of the original car gearbox.

5. Tap **Backup EEPROM Data** to read the EEPROM data of the original car gearbox and then enter the new file name to save it on the tablet.

6. Tap **Backup FLASH Data** to back up the FLASH data of the original vehicle gearbox and then enter the new file name to save it on the tablet.

7. Tap **Disconnect** to disconnect the original vehicle gearbox, and then disconnect the original vehicle gearbox from the BENCH mode cable.

8. Connect the new gearbox ECU to the iSmartIMMO G3 according to the steps 3 and 4.

9. Tap **Restore EEPROM Data**, select the EEPROM data backed up in step 5, and tap **OK** to write the EEPROM data of the original vehicle gearbox in the new gearbox ECU.

10. Tap **Restore FLASH Data** to write the FLASH data of the original vehicle gearbox backed up in step 6 into the new gearbox ECU.

Situation 2:

1. Tap **Gearbox**.

2. Select Gearbox type according to the specific model, here we choose **DQ200-MQB** (take this as an example) to enter the function selection screen.

📋 Note: The function selection screen varies by different vehicle manufacturers.

3. Tap **View Writing Diagram** to view how to connect the original car gearbox ECU with iSmartIMMO G3 using the BENCH mode cable and its associated adaptor cable.

📋 Note: Vehicle gearbox connection could vary depending on gearbox types, for information how to connect the car gearbox, refer to the onscreen connection diagram.
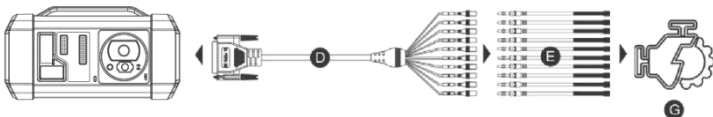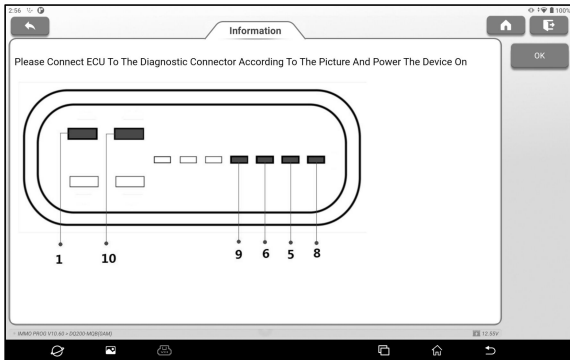
D. BENCH mode cable (optional)

E. Adaptor cable (optional) for the BENCH mode cable

G. Gearbox ECU

4. Tap **Connect** to read the chip ID of the original car gearbox.

5. Tap **Backup EEPROM Data** to read the EEPROM data of the original car gearbox and then enter the new file name to save it on the tablet.

6. Exit **IMMO PROG**. Install the new gearbox on the vehicle and connect the iSmartIMMO G3 to the vehicle's DLC port.

iSmartEV BOX

Diagnostic Main Cable
(Optional)

iSmartIMMO G3
(Optional)
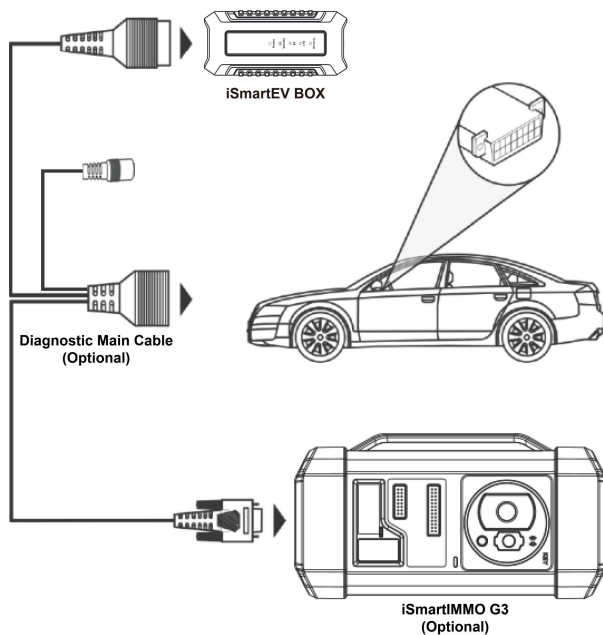
7. Tap **Special Function** on the main interface and then choose **VW** to enter the anti-theft system, select **MQB Instrument -> Replacement Of Parts -> Transmission**, tap **OK**.
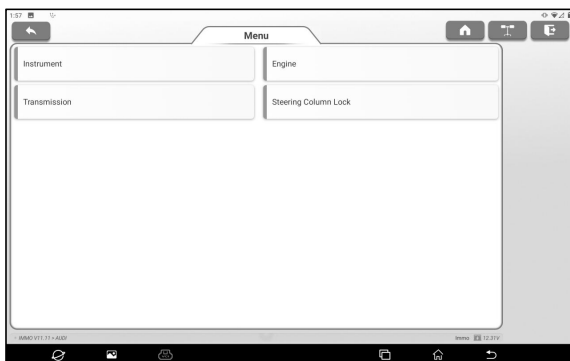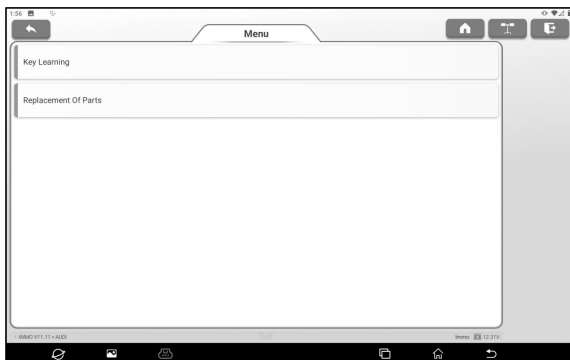
8. Tap **YES** to enter the gearbox replacement screen.
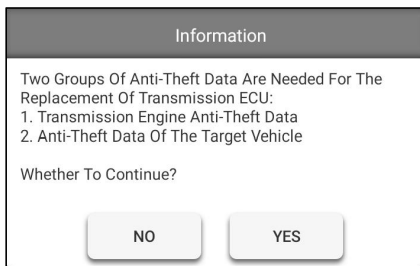
9. When replacing the transmission ECU, two groups of anti-theft data are required:

- Anti-theft data of transmission engine (backed up in step 5)
- Anti-theft data of the target vehicle

1) Select **Edit1**, tap **NO**, tap **Obtain From EEPROM Data**, select the new gearbox EEPROM data backed up in step 5, and tap **OK**.
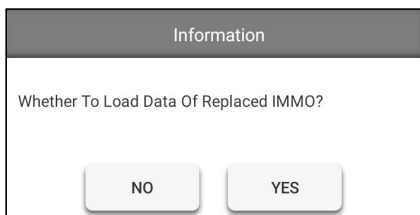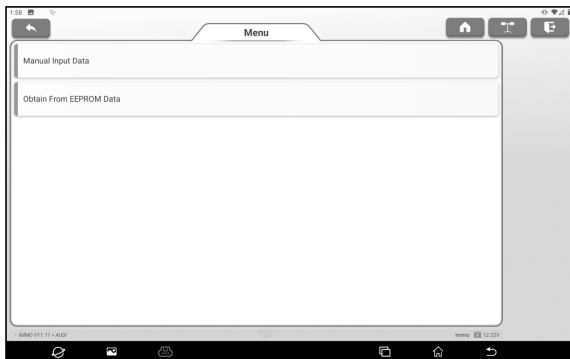
2) Tap **Edit2**, if you have obtained the relevant data of the original vehicle gearbox from other equipment, select **Manual Input Data** and enter the 16-byte CS code of the original vehicle gearbox.
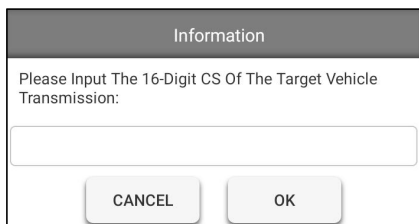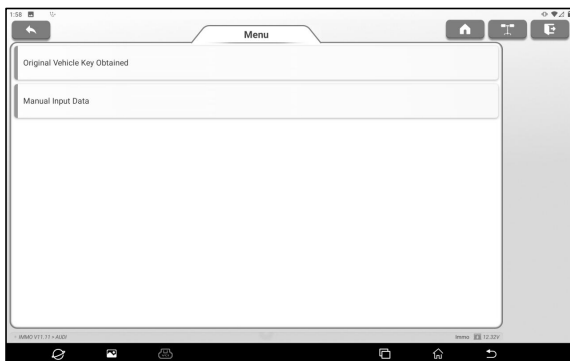
📧 *Note: If there is no anti-theft data of the target vehicle, select Original Vehicle Key Obtained, put the original vehicle key in the iSmartIMMO G3, and just follow the prompts to obtain it, no need to enter any data to complete the replacement.*

10. Tap **Start Replacement**, and input the original car's VIN code, power level and CS code of the original car instrument according to the information prompts to complete the gearbox replacement.
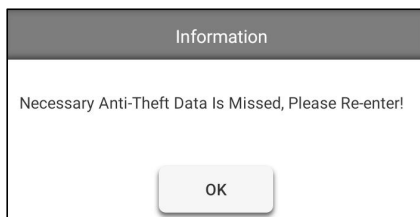
📧 *Note: If Original Vehicle Key Obtained is selected in step 8, the vehicle's VIN code, power level and CS code in this step will be automatically obtained. The user is not required to enter any data to complete the replacement.*

14.2.4 Key Programming

This function allows you to backup old key data, write in data for new keys and detect remote control frequency.

14.2.5 SCM(Single Chip Microcomputer) Programming

This function allows you to read chip (also called MCU) ID, lock/unlock chip, backup/restore EEPROM data and FLASH data.

Notes:

- *The data flow is large when performing reading/writing operations. To improve the communication stability, you are recommended to use a USB cable.*

- *MCU connection could vary depending on MCU types, for information how to connect the MCU, refer to the onscreen wiring diagram.*

15. Software Update

When a new model is added or a new version of software is available, the system will prompt the user to update. It is recommended that the user update to the latest version in time.

On the main interface, tap **Update** to enter the following page:
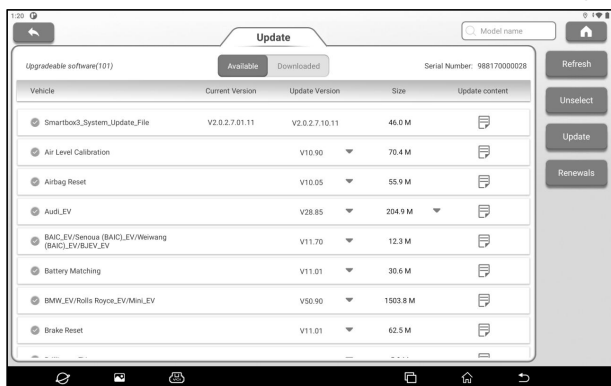
15.1 Update

Under the **Available** tab, tap **Select All** to select all upgradable software or check the software that needs to be upgraded, and tap **Update** to start downloading the software installation package. After the download is complete, the system will automatically install the software.

📝 Note: During the update, ensure that the network connection is normal and stable. If you need to update a lot of software, it may take a long time (depending on the network speed)，please wait in patience.

To cancel the selection of the software, click the check box in front of the software.

Tap the **Downloaded** tab, and the list shows the currently

downloaded software. You can view the software version, installation package size, and software update content on this interface.
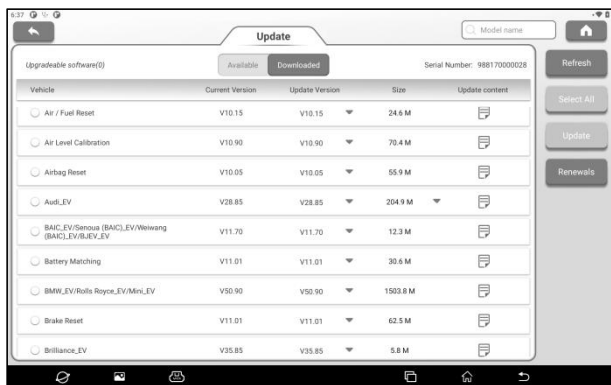
15.2 Renew Subscription

If the software subscription is due or expires, the system will prompt you to renew your subscription.

Tap **Renewals** on the bottom of the screen to enter the payment screen.

1. Tap **Subscription Renewal Card** (*need to buy it from the local dealer where you purchased the equipment).
2. Input the 24-digit pin code of Subscription Renewal Card and then tap **Submit** to finish the renewal.
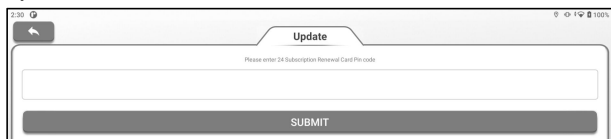
3. Go to update center to update the diagnostic software.

16. Other

16.1 Reports

This option is used to view and manage saved vehicle test reports and test records. On the home screen, tap **Reports** to enter the following page:
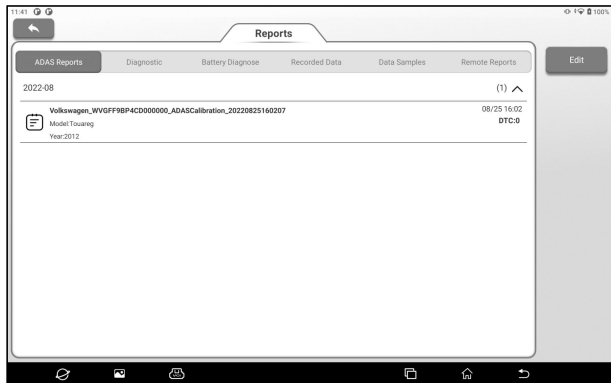
If the test report is saved during the battery diagnose, the report will be displayed on the **Battery Diagnose** tab.

If the test report is saved during the ADAS calibration process, it will be displayed under the label **ADAS Reports**;

If the diagnosis report is saved during remote diagnosis, the report will be displayed under the **Remote Reports** tab.

If the diagnostic report and fault code report are saved during the vehicle diagnosis, the report will be displayed under the **Diagnostic** tab.

Click a single report in the report list to view the report details, print and share the report.

• Tap **Edit** to delete the selected test report, rename the report and share the report.

• Tap **Filter** to select the report type and enter the vehicle VIN number, car series, model or customer name to filter the required from the report list.

If the detected data is recorded on the read data stream screen, the detected data is displayed in the **Recorded Data** tab.

Tap the test record to be played back to enter the following screen:
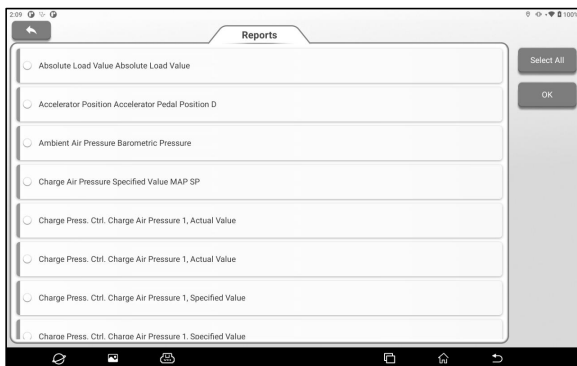
Select the data stream option, and then tap **OK** to enter the playback page:
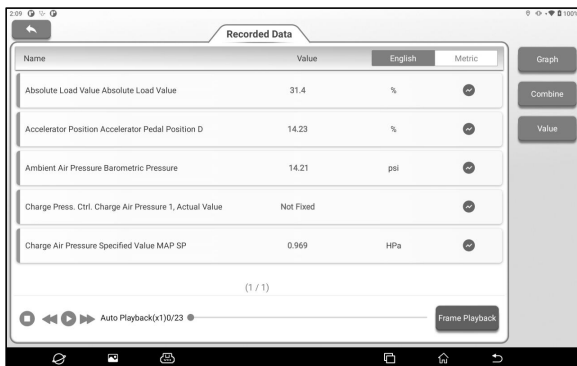
Screen Button Description:

Graph	Play back the selected data stream options graphically.
Combine	Play back the selected data stream options in a combined form.
Value	Playback the selected data stream options numerically.
Frame Playback	Play back the recorded data stream frame by frame.
Automatic Playback	Automatic playback of the recorded data stream.

16.2 Personal center

16.2.1 VCI

This option allows you to manage all your activated VCI devices

16.2.2 Activate VCI

This item lets you activate the VCI connector in case you ignore the Activate VCI step in process of the product sign-up.
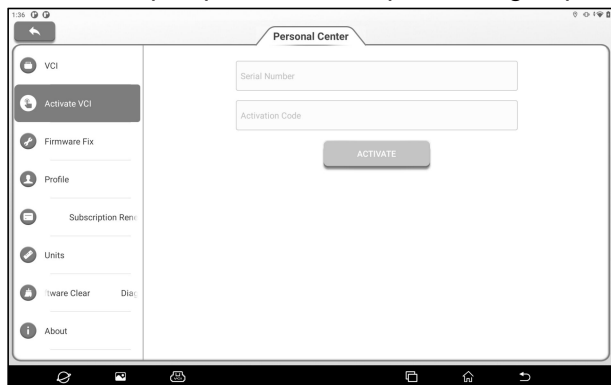
Enter the product serial number and activation code and Tap **Activate**.

16.2.3 Firmware Fix

Use this item to upgrade and fix diagnostic firmware. During fixing, please do not cut power or switch to other interfaces.
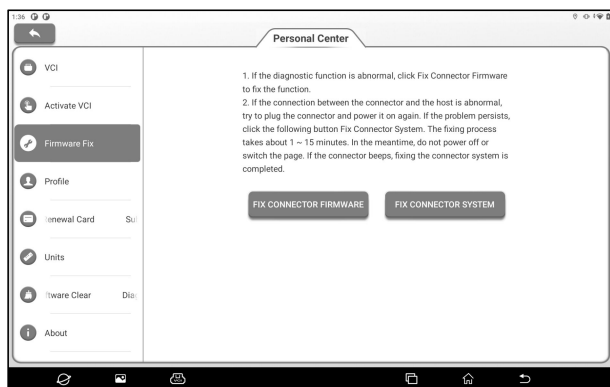
16.2.4 Profile

Use this item to view and configure personal information.
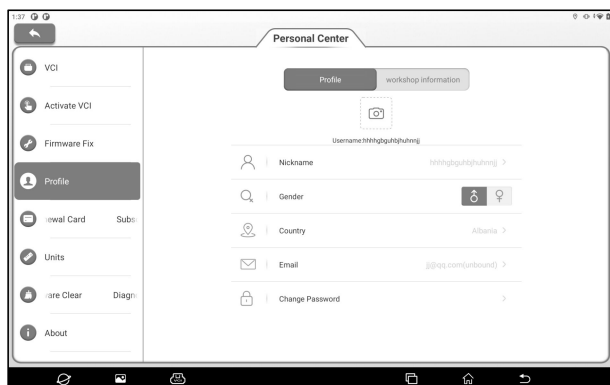
16.2.5 Subscription Renewal Card

This item is used to check the status of the subscription renewal card.
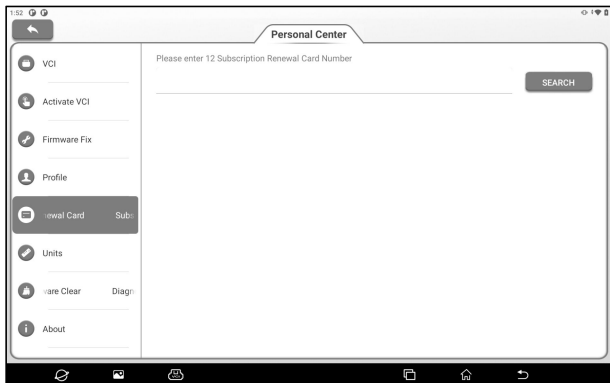
16.2.6 Units

It is designed to configure the measurement unit. Metric System and English System are available.
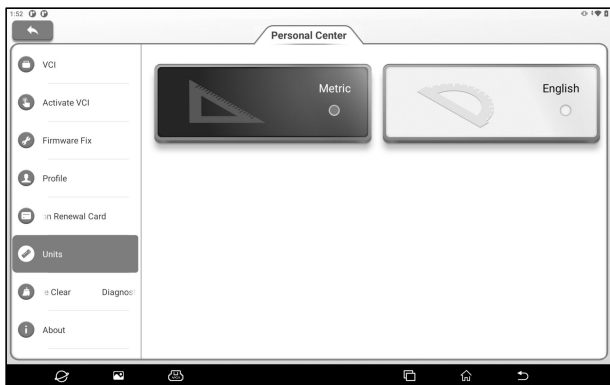
16.2.7 Diagnostic Software Clear

This item allows you to hide/clear the diagnostic software that is not frequently used.

📝 Note: Removing software may completely delete the software from the tool.

If some software is not used and the tool runs out of space, you can use this feature to remove it. To re-download it, go to **Update** *->* **Available***.*

16.2.8 About

The software version information and disclaimer are included.
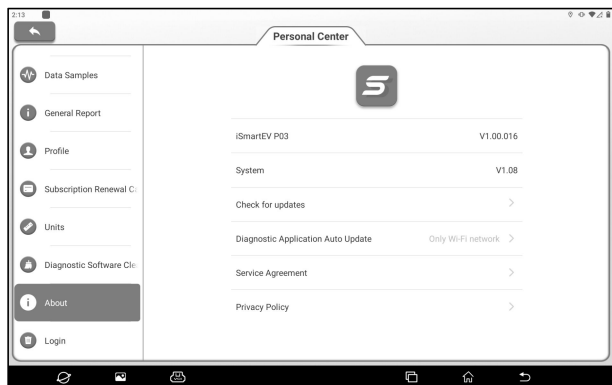
16.2.9 Login/Log out

Tap **Log Out** button to log out.

16.3 Feedback

If an unsolvable problem or diagnostic software problem is encountered during diagnosis, the user can report the problem (the last 20 test records) back to us. After receiving your feedback, we will follow up and deal with it in time, so as to improve our product quality and user experience.

There are three available options:

Feedback	Displays a list of all models that have been tested.
History	Click to view the progress of all submitted diagnostic feedback.
Offline-list	Click to view the diagnostic feedback of upload failure

	due to network problems. Once the network is restored, the system will automatically upload the data to the server.

Under the **Feedback** tab, click the corresponding model or special function of the diagnosis record to enter.

Tap **Choose File** to open the target folder, select the diagnostic log that needs feedback, and then select the corresponding diagnostic feedback problem type. Enter the fault description and contact information of the feedback person in the text box. Then tap **Submit Result** to send it to us.

After receiving your fault feedback, we will follow up your feedback report in time. Please pay attention to the progress and results of diagnosis feedback in **History**.

16.4 Setting

This option is used to set the system and view device information.

16.4.1 Network and Internet

To set the wireless network connection, please perform the following steps:

📖 *Note: The power consumption of the device increases after the WLAN is enabled. You are advised to turn off the WLAN when it is not in use to save power.*

1. On the home screen, tap **Other** -> **Setting** -> **Network and internet** -> **Wi-Fi**.
2. Tap or slide the WLAN switch on. The device automatically scans for available wireless networks.
3. Select the network you want to connect to:
- If you choose an open network, you can connect directly to that network.
- If you choose an encrypted network, you will need to enter an access password before you can connect.
4. If "Connected" is displayed, the connection is successful.

16.4.2 Bluetooth

Used to set up Bluetooth communication connection.

1. On the home screen, tap **Other** -> **Setting** -> **Connected Devices**.

2. Tap **Pair New Device**. The tablet automatically scans for available devices. Select the device you want to connect to. A dialog box will pop up on the tablet and the selected device. After confirming the correct pairing code, tap **PAIR** on both the tablet and the device to complete the Bluetooth connection.

16.4.3 Apps & Notifications

It is used to manage App permissions and view application notifications.

16.4.4 Battery

Used to view the App power usage and enable the power saving

mode of the device.

16.4.5 Display

Used to set and adjust device display parameters.

Brightness

1. On the main interface, tap **Other** -> **Setting** -> **Display** -> **Brightness Level**.
2. Drag the slider to adjust the brightness.

In addition, users can also slide down the screen to bring up the system shortcut bar to adjust the screen brightness.

Adaptive Brightness

Tap or slide the **Adaptive Brightness** switch to open to enable the device to automatically adjust and optimize the display brightness of the device according to the ambient light conditions.

Wallpaper

This option is used to set the wallpaper picture of the device.

Screen Timeout

This option is used to set the automatic screen-down time of the device.

1. On the main interface, tap **Other** -> **Setting** -> **Display** -> **Screen Timeout**.
2. Select a screen timeout period.

Font Size

This option is used to set the font size displayed on the device screen.

Screen Saver

This option enables the screen saver function and sets the screen saver background.

16.4.6 Sound

Used to set the device volume.

16.4.7 Storage

It is used to manage App storage space and clear App data and caches.

16.4.8 Privacy

It is used to manage device privacy rights. This includes the permission for an App to access device data, whether characters are displayed briefly when entering a password, and whether notifications are displayed when the screen is locked.

16.4.9 Location

Used to manage Apps' access to and use of device location information.

16.4.10 Security

Used for security management such as device lock screen encryption, blocking/allowing the installation of applications from unknown sources.

16.4.11 System

Used to set device system information, including setting of device language and input methods, gesture, date and time parameters, backup, reset and multi-user access etc.

16.4.12 USB management

Used to set the USB switch of the device.

1. After you select this option, set the USB switch status to **ON**. In

this case, the USB Type-C port is only used for charging.

2. Deselect this option and set the USB switch status to **OFF**. In this case, the USB Type-A port on the device stops being used. The USB Type-C port can be used to charge the device and connect the computer to transfer files.

Note: Keep the USB switch ON when the device uses Wi-Fi for wireless diagnosis.

16.5 File Management

This module is the file and program manager. Users can access and create folders directly on the device without connecting to a computer.

16.6 TeamViewer

In case of equipment operation problems, you can use this module to request assistance from the other party.

After you start Remote control (TeamViewer QuickSupport), QuickSupport will automatically assign your ID, and the screen displays as follows:
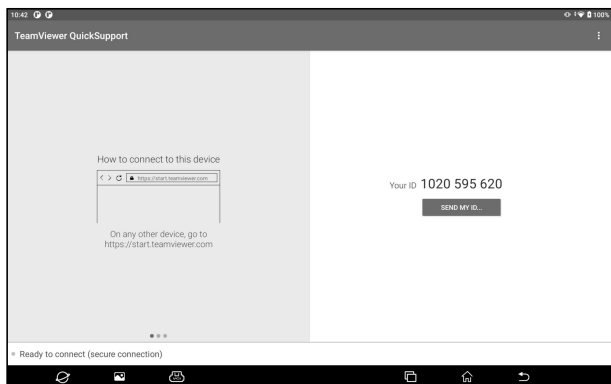
Send your ID to the other party. After the other party enters your ID in TeamViewer, tap **Connect to Partner** to remotely control

your device.

16.7 Browser

This module can be used to browse the web.

16.8 System OTA upgrade

This module is used to upgrade the system.
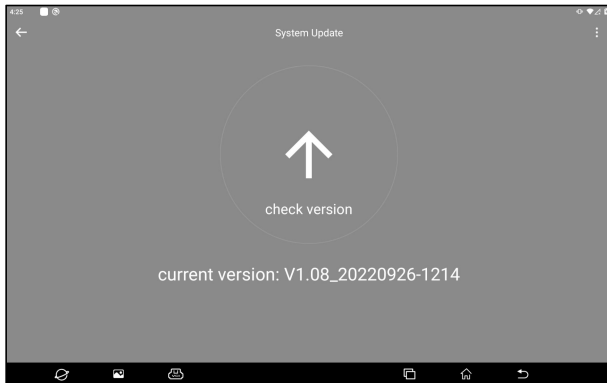
After entering, tap **Check Version**, the system starts to check whether the current version is the latest version. If the version is the latest, the system will prompt "Current version is the latest version".

📖 Note: When performing OTA upgrades, ensure that the device has at least 70% power and that no programs are running during the upgrade.

16.9 Gallery

This feature can be used to take photos, videos and manage galleries (including screenshots).

16.10 Recording Master

A simple-to-use, convenient and quick screen recording software. Support recording screen playback, GIF animation and sharing functions.

16.11 Video Player

This module is used to play music and video files.

16.12 E-mail

This module is used to receive and send e-mail.

16.13 Camera

The module is used to take photos and record videos.

17. Frequently Asked Questions

1. How to save electricity?

1) Close the screen when the device is not in use.

2) Shorten screen standby time.

3) Reduce the screen brightness.

4) Disable the WLAN connection if you do not need to use the WLAN.

2. Failed to communicate with vehicle ECU?

Please confirm:

1) Check whether the VCI connector is properly connected.

2) Whether the ignition switch of the vehicle is turned on.

3) If the above are confirmed to be normal, please send the vehicle type, year, model and VIN code to us through **Other -> Feedback** module.

3. Unable to enter vehicle ECU system?

Please confirm:

1) Whether the test vehicle is equipped with this system.

2) Check whether the VCI connector is properly connected.

3) Whether the ignition switch of the vehicle is turned on.

4) If the above are confirmed to be normal, please send the vehicle type, year, model and VIN code to us through **Other -> Feedback** module.

4. The detection connector is not energized when connected to the vehicle.

Please confirm:

1) If the VCI connector is improperly connected, reconnect the connector.

2) Poor line contact of vehicle diagnosis seat.

3) The vehicle battery itself has a serious power deficit.

4) The detection connector is damaged.

5. How to reset the iSmartEV P03 tablet?

Please reset the device according to the following procedures:

1) On the home screen, tap **Other** -> **Setting** -> **System** ->
   Reset Options.

2) Tap **Erase All Data (Factory Reset)**.

3) Tap **Erase All Data** and wait for the system to recover until the
   tablet automatically restarts。

⚠ *Warning: Resetting the device will result in the loss of device data. Before using it, please ensure that important data has been backed up.*

FCC Warnning

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

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 suppliers 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, Tian 'an Yungu Industrial 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.