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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.*

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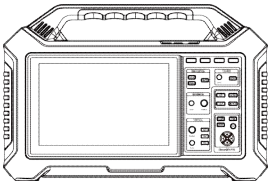
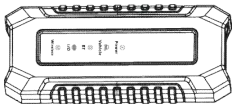
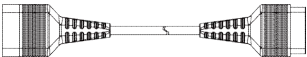
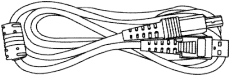
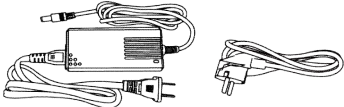
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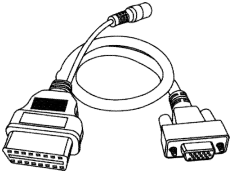

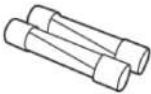
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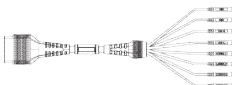









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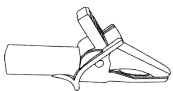
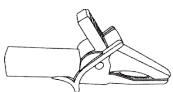
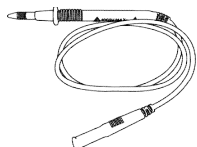
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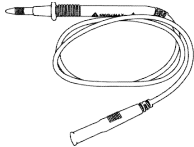
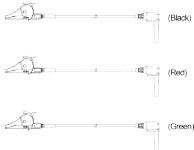

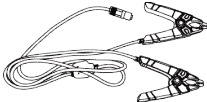
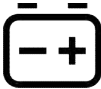
1. Packing List

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	<p>Black </p> <p>Red </p> <p>Blue </p> <p>Green </p> <p>Yellow </p>
3	Oscilloscope Crocodile Chuck (Black)	1	
4	Oscilloscope Crocodile Chuck (Red)	1	
5	Multimeter Test Lead (Black)	1	

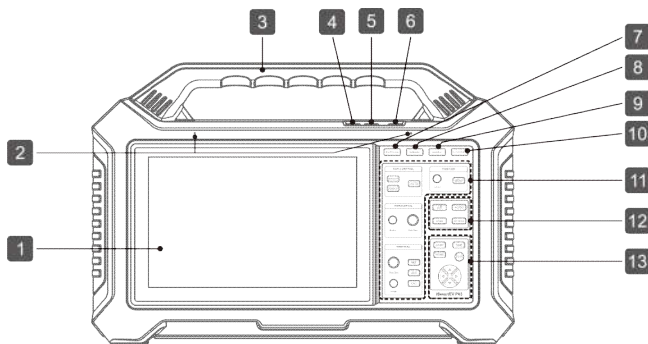
6	Multimeter Test Lead (Red)	1	
7	Insulation Tester Test Clip	1	
8	Current Clamp	1	
9	Current Clamp Test Clip	1	
10	9V Square Battery	1	

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

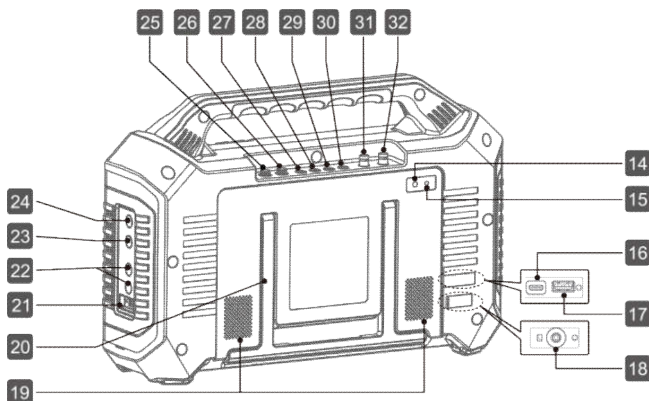
the equipment.

- 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 Area12. Multimeter Function
Button Area13. 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
Port22. 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

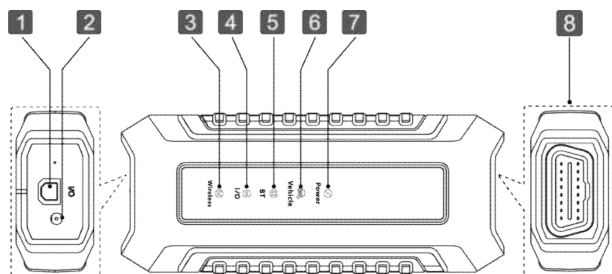
31~32 are related interfaces of oscilloscope function module:

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

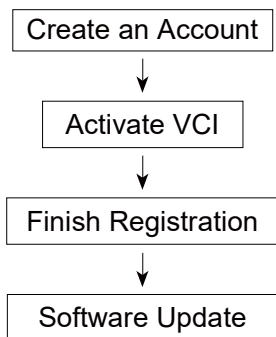
Press and hold the power button on the device until the shutdown prompt dialog box pops up on the screen, tap **Power off** to shut down the device or tap **Restart** to restart the device.


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.

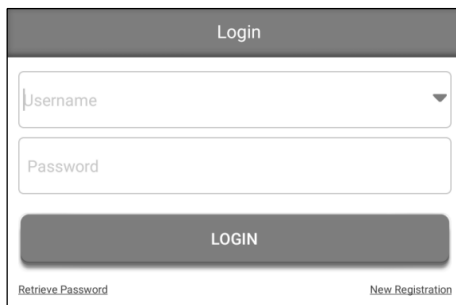
3.4 Registration and Update

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



 **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:

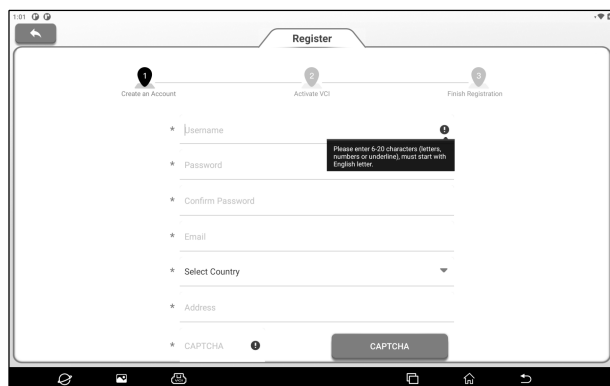
A login dialog box with a dark gray header labeled "Login". It contains two input fields: "Username" with a dropdown arrow and "Password". Below these is a large dark gray button labeled "LOGIN". At the bottom, there are two links: "Retrieve Password" on the left and "New Registration" on the right.

(If you are a new user, follow Section A.)

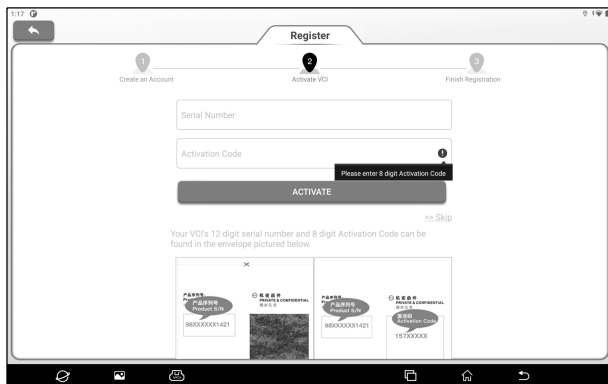
(If you are registered, please refer to Section B for login.)

(If you forget your password, please refer to Section C to reset it.)

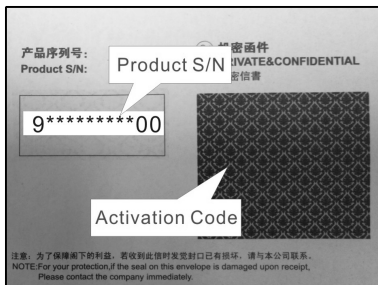
A. If you are a new user, please tap **New Registration** to enter the registration page.

A registration page titled "Register" with a progress bar at the top showing three steps: "Create an Account" (1), "Activate VCI" (2), and "Finish Registration" (3). The main form has several fields, each with an asterisk indicating it is required: "Username", "Password", "Confirm Password", "Email", "Select Country" (with a dropdown arrow), "Address", and "CAPTCHA". A tooltip for the Password field states: "Please enter 6-20 characters (letters, numbers or underline), must start with English letter". At the bottom right is a dark gray button labeled "CAPTCHA". The page is framed by a mobile app interface with a back arrow at the top left and various icons at the bottom.

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.

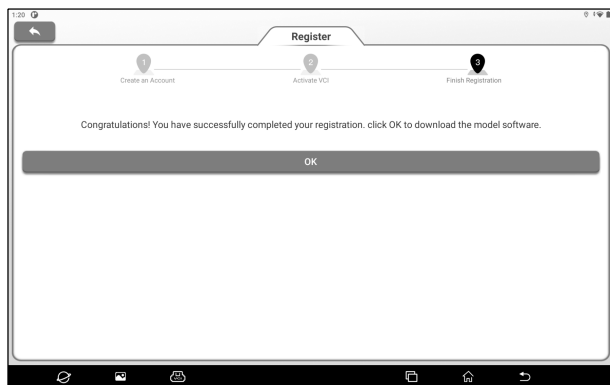


Enter the product serial number and activation code. The product serial number and activation code can be obtained from the password envelope in the package box.

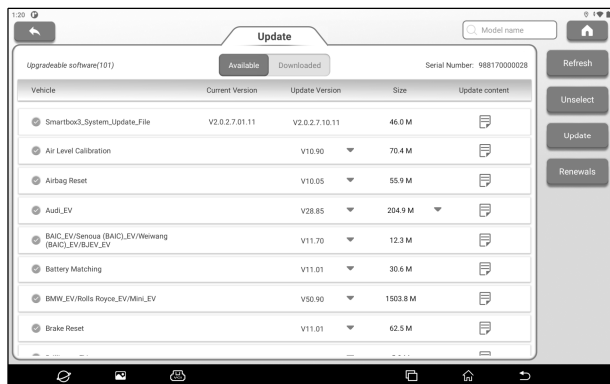


Note: If you skip the activation step here, you can also go to **Other -> Personal Center -> Activate VCI** to activate after entering.

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.*

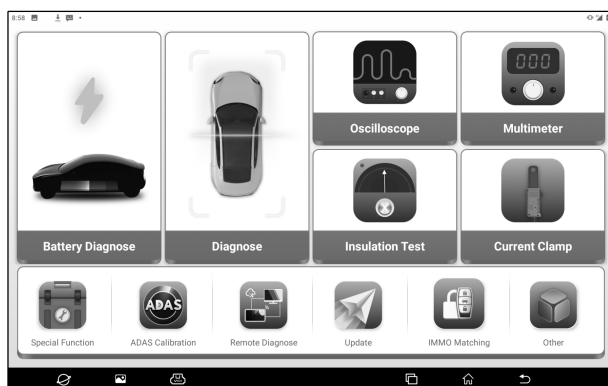
C. If you forget the password, please tap **Retrieve Password** and then set the new password according to the prompts on the screen.

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	Used to measure the insulation resistance of

Test	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.
	Process 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 Preparation and Vehicle Connection

4.2.1 Preparation

Normal Test Conditions

- 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.

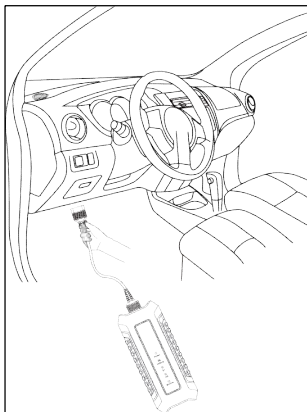
Find DLC position: The DLC (Data Link Connector) is usually located 12 inches from the center of the instrument panel, under

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.

4.2.2 Vehicle Connection


Connect one end of the included OBD extension cable to the OBD-II port of iSmartEV BOX, and the other end to the vehicle's DLC port.



4.3 Communication Settings


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

4.3.1 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.

4.3.2 USB Communication

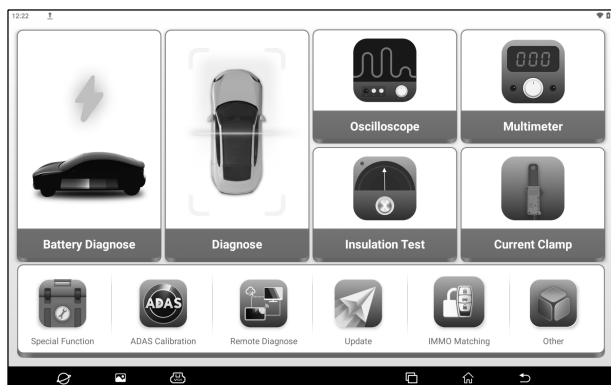
When the tablet and VCI connectors are connected through USB cables, the system automatically switches to USB communication mode. At this time the VCI connector icon  at the bottom of the screen will light up, and the USB indicator of the VCI connector will also light up.

5. Battery Diagnose

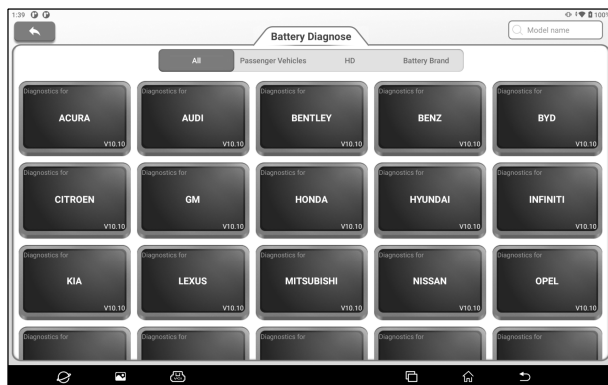
This function is used to check the detailed data and fault information of battery pack, helping users to quickly determine the abnormal status and fault point of battery pack.

⚠ 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.

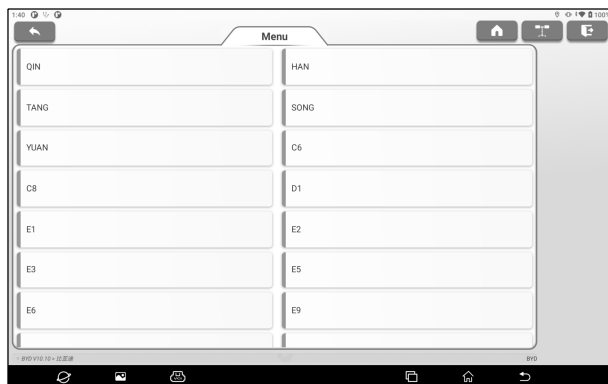
1. Start the iSmartEV P03 and tap **Battery Diagnose** on the main interface.



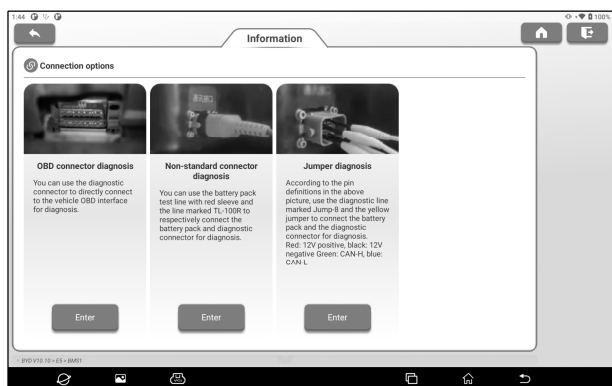
2. Select the vehicle brand or battery pack brand (You can find it quickly through the search bar in the upper right corner).



Select the vehicle model and year.

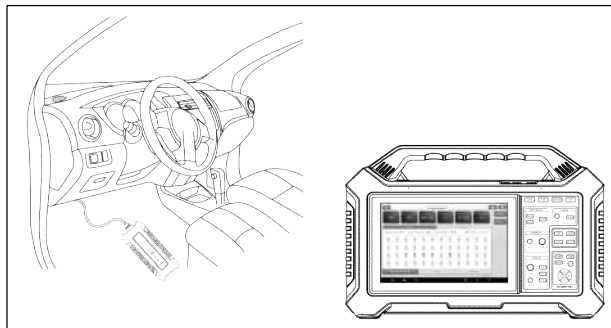


3. Select the connection method of battery pack.



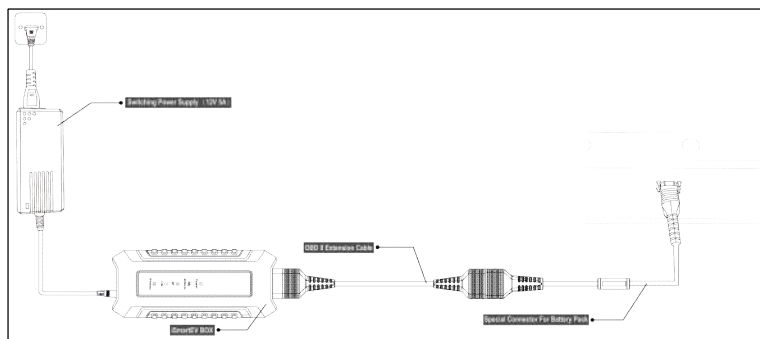
A. OBD Connector Diagnosis

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

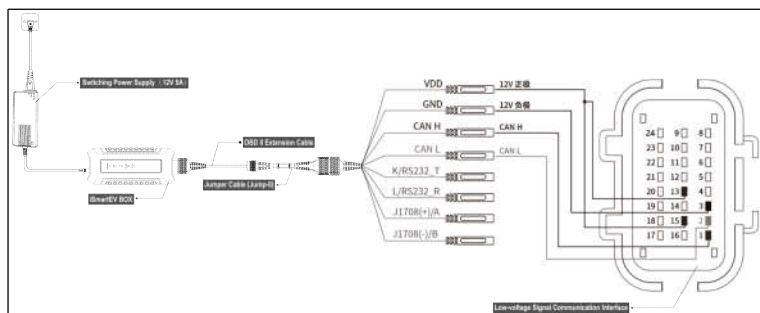
Connect the iSmartEV BOX and the low-voltage signal communication interface of the battery pack respectively with the battery pack special connector (optional) to test the vehicle battery pack.



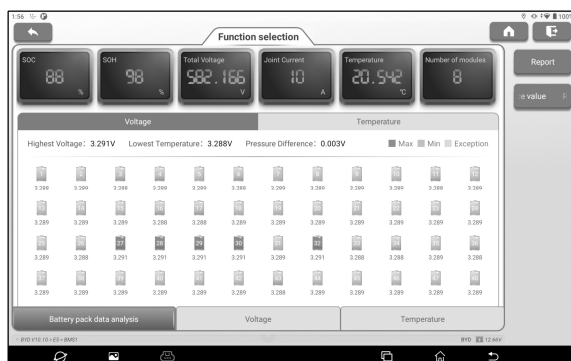
C. Jumper Diagnosis

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.
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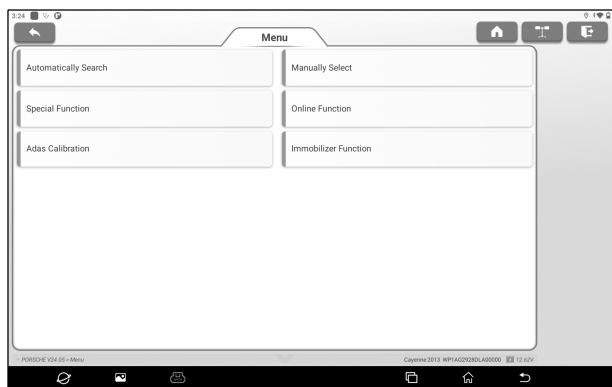
6. Diagnose

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 AutoDetect

Use **AutoDetect** 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.

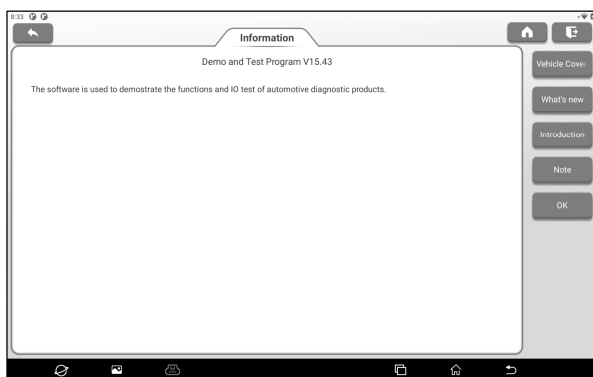


6.2 Manual Selection

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



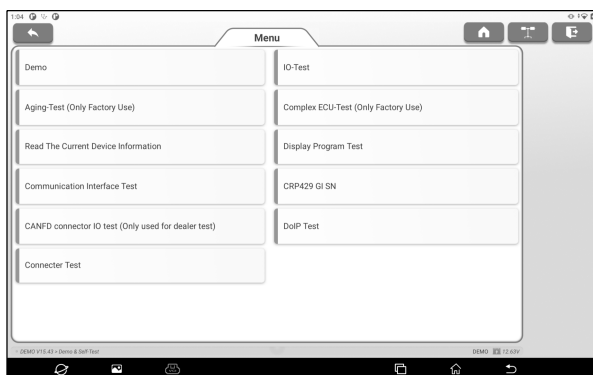
2. Click the vehicle brand to be tested to enter the model version information interface. Here we take Demo (Version 15.43) as an example to demonstrate how to diagnose a vehicle.



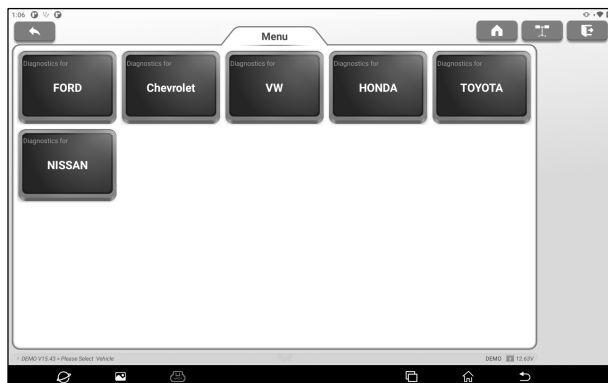
Screen Button Description:

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.

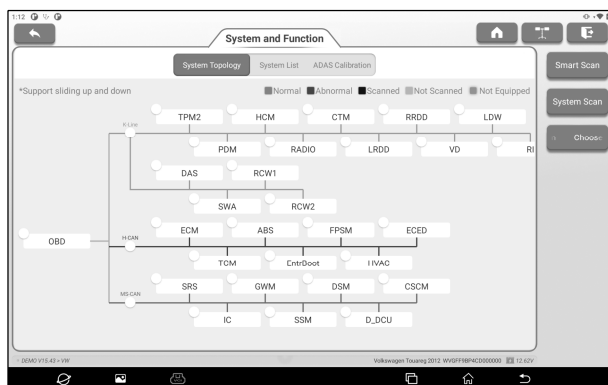
3. Tap **Demo** to go to the next step.



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.