User Manual

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Important Safety Precautions

Important: To avoid personal injury, property damage, or accidental damage to the product, read all of the information in this section before using the product.

- Never collide, throw, or puncture X-431 Throttle, and avoid falling, extruding and bending it.
- Do not insert foreign objects into or place heavy objects on your device. Sensitive components inside might cause damage.
- Do not use X-431 Throttle in exceptionally cold or hot, dusty, damp or dry environments.
- In places using X-431 Throttle may cause interference or generate a potential risk, please turn it off.
- X-431 Throttle is a sealed unit. There are no end-user serviceable parts inside. All internal repairs must be done by an authorized repair facility or qualified technician. If there is any inquiry, please contact the dealer.
- Never place X-431 Throttle into apparatus with strong electromagnetic field.
- Keep X-431 Throttle far away from magnetic devices because its radiations can damage the screen and erase the data stored on X-431 Throttle.
- DANGER: Do not attempt to replace the internal rechargeable lithium battery. Contact the dealer for factory replacement.
- CAUTION: Please use the included battery and charger. Risk of explosion if the battery is replaced with an incorrect type.
- Do not disconnect power abruptly when X-431 Throttle is being formatted or in process of uploading or downloading. Or else it may result in program error.
- Do not delete unknown files or change the name of files or directories that were not created by you, otherwise your X-431 Throttle software might fail to work.
- Be aware that accessing network resources can leave your X-431 Throttle vulnerable to computer viruses, hackers, spyware, and other malicious activities that might damage your device, software or data. It is your responsibility to ensure that you have adequate protection in the forms of firewalls, antivirus software, and anti-spyware software and keep such software up to date.

Precautions on Using X-431 Throttle

Before using this test equipment, please read the following safety information carefully.

- Always perform automotive testing in a safe environment.
- If the diagnostic connector remains unused for a long period of time, it is suggested to unplug the connector from vehicle's DLC to conserve battery power.
- Wear an ANSI-approved eye shield when testing or repairing vehicles.
- The vehicle shall be tested in a well-ventilated work area, as engines produce various poisonous compounds (hydrocarbon, carbon monoxide, nitrogen oxides, etc.)
- Do not connect or disconnect any test equipment while the ignition is on or the engine is running.
- Put blocks in front of the drive wheels and never leave the vehicle unattended while testing.
- Keep the test equipment dry, clean, free from oil, water or grease. Use a mild detergent on a clean cloth to clear the outside of the equipment as necessary.
- Do not drive the vehicle and operate the test equipment at the same time. Any distraction may cause an accident.
- Keep clothing, hair, hands, tools, test equipment, etc. away from all moving or hot engine parts.
- Before starting the engine, put the gear lever in the Neutral position (for manual transmission) or in the Park (for automatic transmission) position to avoid injury.
- To avoid damaging the test equipment or generating false data, please make sure the vehicle battery is fully charged and the connection to the vehicle DLC (Data Link Connector) is clear and secure.
- Automotive batteries contain sulfuric acid that is harmful to skin. In operation, direct contact with the automotive batteries should be avoided. Keep the ignition sources away from the battery at all times.

Precautions on Operating Vehicle's ECU

- Do not disconnect battery or any wiring cables in the vehicle when the ignition switch is on, as this could avoid damage to the sensors or the ECU.
- Do not place any magnetic objects near the ECU. Disconnect the power supply to the ECU before performing any welding operations on the vehicle.

- Use extreme caution when performing any operations near the ECU or sensors. Ground yourself when you disassemble PROM, otherwise ECU and sensors can be damaged by static electricity.
- When reconnecting the ECU harness connector, be sure it is attached firmly, otherwise electronic elements, such as ICs inside the ECU, can be damaged.

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1 Introduction

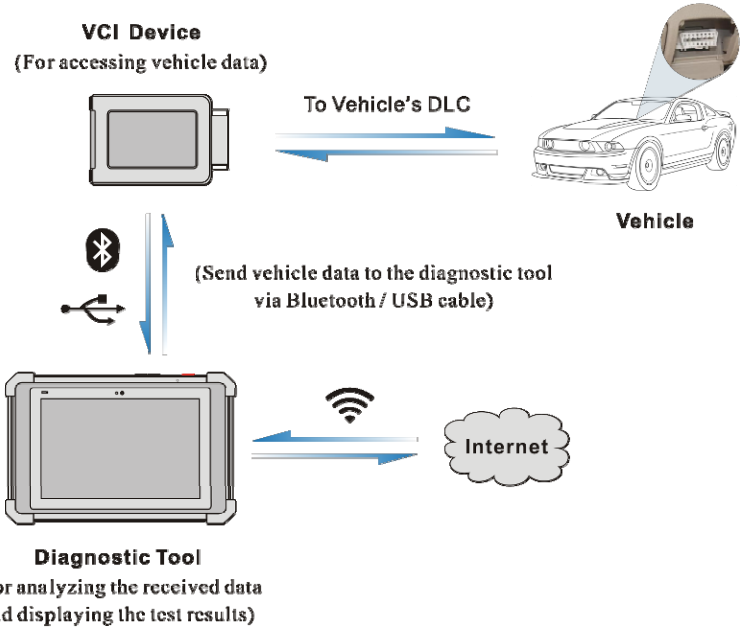
1.1 Product Profile

X-431 Throttle is an evolutionary smart solution for specialized automotive diagnosis and maintenance. It is characterized by featuring powerful functions, and providing precise test result.

Through simple Bluetooth communication / USB cable between the VCI device and X-431 Throttle handset, it achieves full car model and full system vehicle trouble diagnosis, which include Reading DTCs, Clearing DTCs, Reading Data Stream, Actuation Test and Special Functions.

X-431 Throttle adopts a higher performance-price ratio tablet, which is equipped with Android 7.1 operating system, 8-core 2GHz CPU and 10.1" sunlight readable capacitive touch screen with a resolution of 1920 x 1200 pixels.

The following illustration shows how the X-431 Throttle system works.



1.2 Features

1. Diagnose:

- Smart Diagnosis (AutoDetect): This module allows you to use the VIN information of the currently identified vehicle to access its data (including vehicle information, historical diagnostic records) from the cloud server to perform quick test.
- Local Diagnosis: To perform diagnosis by executing on-screen commands step by step. Diagnosis functions include: Read DTCs, Clear DTCs, Read Data Stream, Special Functions etc.
- I/M Readiness: I/M refers to Inspection and Maintenance that is legislated by the Government to meet federal clean-air standards. I/M Readiness indicates whether or not the various emissions-related systems on the vehicle are operating properly and are ready for Inspection and Maintenance testing.
- Tech-To-Tech: This option aims to help repair shops or technicians launch instant messaging and remote diagnosis, making the repair job getting fixed faster.
- Maintenance & Reset: All kinds of common maintenance and reset items including Oil lamp reset, DPF regeneration, ABS bleeding etc. can be done.
- Diagnostic History: Provides a quick access to the tested vehicles and users can choose to view the test report or resume from previous diagnostic session, without the necessity of starting from scratch.
- Pre- and Post- Repair Result Comparison: By comparing the pre-repair and post-repair report, you can clearly determine which vehicle issues have been fixed and which remained unsolved.
- One-click Update: Lets you update your diagnostic software online.
- Diagnostic feedback: Enables you to submit the vehicle issue to us for analysis and troubleshooting.
- Repair Info: Multiple speed dial to professional repair website are available for helping repair professionals diagnose and repair vehicle efficiently, accurately and profitably.
- Vehicle Coverage: Enables you to quickly check which vehicle models are supported.
- Backup/Restore: This feature lets you back up the recorded files to external storage device/restore the recorded data from external storage device.
- Add-on Modules: Scopebox, Sensorbox, Batterybox and Videoscope (sold separately) are available for extending the functions of X-431 Throttle.

2. Compatible with Wi-Fi projecting technology: To mirror your X-431 Throttle screen onto an external projector or monitor with HD I/O interface via wireless technology.
3. Web browser: Users can make online search and visit any website.

1.3 Technical Specifications

1.3.1 X-431 Throttle handset

Operating system	Android 7.1
Processor	8-core 2GHz processor
Battery	9000mAh rechargeable polymer lithium battery Charging via 5V DC power supply
Memory	4GB
Storage	64GB
Screen	10.1 inch capacitive touch screen with a resolution of 1920 x 1200 pixels
Camera	Front-facing 8.0MP camera + rear-facing 13MP camera
Connectivity	• WLAN (802.11b/g/n/ac) • Universal serial BUS Ports (1 x Type-C + 1 x Type-A) • Bluetooth 2.1 & 2.4
Sensor	• Gravity Accelerometer • 3-Axis Acceleration Sensor
Working temperature	-10℃ ~ 50℃(14 ~122℉)
Storage temperature	-20℃ ~ 70℃(-4 ~158℉)

1.3.2 VCI connector

Working voltage	DC 9 ~18V
Average working current	About 35mA

Standby current	About 25mA
Working temperature	-20℃ to 55℃(-4 ~131℉)
Storage temperature	-30℃ to 70℃(-22~158℉)

2 Knowledge of X-431 Throttle

There are three main components to the X-431 Throttle system:

- X-431 Throttle tablet – the central processor and monitor for the system (See Chapter “2.1”)
- Docking Station – the platform for charging X-431 Throttle tablet and extending functions (For details, please refer to Chapter 2.2.)
- VCI device – the device for accessing vehicle data (See Chapter “2.3”)

2.1 X-431 Throttle tablet

The handset acts as the central processing system, which is used to receive and analyze the live vehicle data from the VCI connector and then output the test result.

2.1.1 Top view

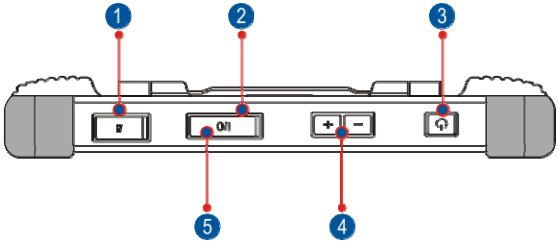


Fig. 2-1

1	**Memory Card Slot**	To store the memory card for storage expansion.
2	**Charging Port**	Reserved for charging the handset.
3	**Power/Screen Lock Button**	To turn the handset on/off with long press, or lock the screen with short press.
4	**Volume Buttons**	To adjust the volume. *Note: Press and hold [POWER] and [VOL -] key to

		capture the current screenshot.
5	**Data Transmission Port**	Reserved for add-on modules (such as Batterybox, Scopebox and Sensorbox), and other devices with similar port.

2.1.2 Front view

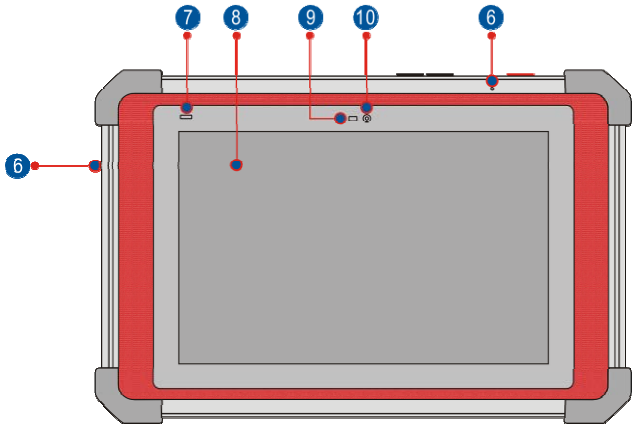


Fig. 2-2

6	**Microphone**	To adjust the volume.
7	**Charging indicator**	It illuminates red while the handset is charging. Once charging is finished, it will illuminate solid green.
8	**Touch Screen**	
9	**Ambient Light Sensor**	
10	**Front Camera**	

2.1.3 Rear view

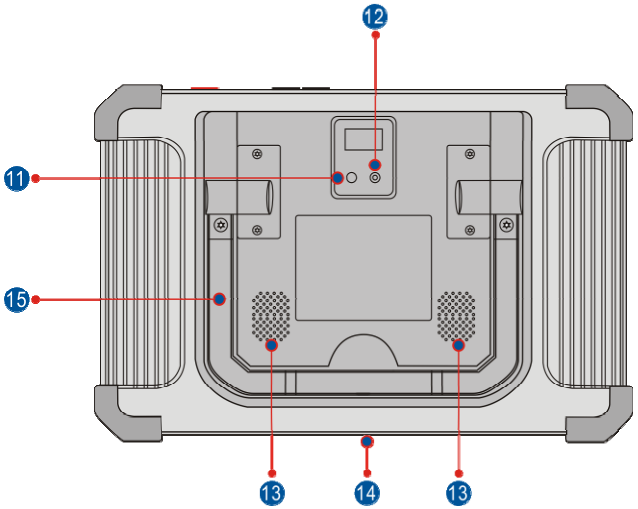


Fig. 2-3

11	**Rear Camera**	
12	**Camera Flash**	
13	**Audio Speaker**	
14	**Charging Slot**	Align it with the charging slot on the docking station to charge the handset.
15	**Adjustable Kickstand**	Flip out it to any angle and work comfortable at your desk, or hang it on automotive part.

2.2 Docking Station

Fig. 2-4

1	**Charging Slot**	
2	**OBD16 Socket**	To store the VCI device to avoid loss.
3	**Data Transmission Port**	Reserved for add-on modules, and other devices with similar port.
4	**Charging Port**	Use the power adaptor to supply power to the docking station through connection to AC outlet.
5	**Power LED**	Illuminates solid green when it is powered up.

2.3 VCI Connector

The VCI connector works as a vehicle communication interface device, which is used to connect to the vehicle's DLC (Data Link Connector) socket directly or via OBD II extension cable to read the vehicle data and then send it to the X-431 Throttle handset via wireless communication technology.

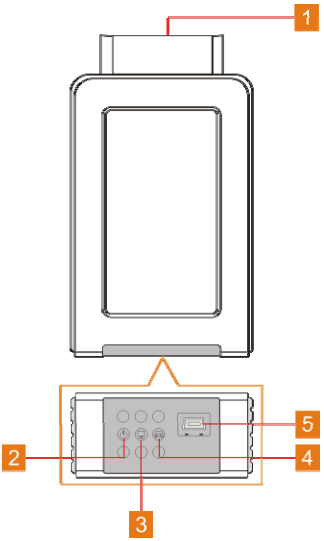


Fig. 2-5 VCI connector

1	**OBD-16 diagnostic connector**	To connect on vehicle's OBD II DLC.
2	**Power indicator**	It lights up while the connector is plugged into the vehicle's DLC.
3	**Wireless (BT)/data cable communication indicator**	• It indicates wireless (BT) communication mode if the VCI is energized and illuminates blue (default mode). • It illuminates red when the VCI is connected to the diagnostic tool via data cable.
4	**ECU communication indicator**	It flashes when the VCI is communicating with the vehicle.
5	**Data Transmission port**	To connect to the handset to perform vehicle diagnosis via data cable.

2.4 Package List

For different product configurations, the accessories may vary. For detailed accessory items, please consult from the local agency or check the package list supplied with X-431 Throttle together.

No.	Item	Descriptions	Qt.
1	X-431 Throttle handset	Indicates the test result.	1
2	Docking station	To dock or charge the handset.	1
3	VCI device	Collects the vehicle data and sends it to the handset for analysis.	1
4	OBD II extension cable	To connect the VCI device to the OBD II vehicle's DLC.	1
5	Power adaptor	To charge the handset.	1
6	OBD I adaptor	An adaptor cable for connecting non-16 pin connector.	1
7	Cigarette lighter cable	To supply power to the non-16pin connector from the vehicle's cigarette lighter receptacle.	1
8	Battery clamps cable	To supply power to the non-16pin connector through connection to the vehicle's battery.	1
9	Password envelope	A piece of paper bearing the product Serial Number and Activation Code for product registration.	1
10	Non-16pin adaptor cable kit	To connect to the vehicle equipped with non-OBD II management system.	(Optional)

3 Preparations

3.1 Charging X-431 Throttle

Choose any of the followings to charge your handset:

A. Use the included 5V power adaptor: Connect one end of the power adaptor to Type C charging port of the handset, and the other end to the AC outlet. Never use other similar adaptors to charge it.

B. Use the docking station: Follow the steps described as below to charge your handset:

1. Locate the charging slot on the bottom of the handset and docking station.
2. Align the charging slots, and then dock the tablet into the station to ensure that it is firmly seated on the docking station.
3. Insert one end of the included power cord to the charging port of the docking station, then the other end into the AC outlet. The charging LED illuminates solid red while charging.
4. Once it illuminates solid green, it indicates that the battery is fully charged. Disconnect the docking station from the AC outlet.

3.2 Using Your Battery

- If the battery remains unused for a long period of time or the battery is completely discharged, it is normal that the tool will not power on while being charged. Please charge it for a period of 5 minutes and then turn it on.
- Please use the included power adaptor to charge your tool. No responsibility can be assumed for any damage or loss caused as a result of using power adaptors other than the one supplied.
- While X-431 Throttle has low battery, a beep will sound. If it is very low, X-431 Throttle will be switched off automatically.

3.3 Power on/off

3.3.1 Power on

Press [POWER] to turn the tool on.

*Note: If it is the first time you have used this tool or the tool remains idle for a long period of time, the tool could fail to turn on. Please charge the tool for a minimum of 5

minutes and attempt to turn on again.

3.3.2 Power off

Press [POWER] for 3 seconds, an option menu will pop up on the screen. Tap “Power off” to turn the tool off.

To perform a forced shutdown, press [POWER] for more than 8 seconds until the screen goes dark.

3.4 Tips on Finger Operations

	Single-tap: To select a item or launch a program.
	Double-tap: To zoom in so that the text on a webpage appears in a column that fits your device’s screen.
	Long press: Tap and hold on the current interface or area until a contextual menu pops up on the screen, and then release it.
	Slide: To jump to different pages.
	Drag: Tap the desktop icon and drop it to other location.
	Spread apart/pinch together: To zoom in manually, place two fingers on the screen and then spread them apart. To zoom out, place two fingers apart on the screen and then pinch them together.

3.5 Lock & Unlock Screen

Many screen lock modes are available on X-431 Throttle.

*Note: You are recommended to set screen lock as “None” since X-431 Throttle is a frequently used diagnostic tool.

3.5.1 Lock the screen

- When it is ON, press [POWER] once to lock the screen;
- The system will lock the screen automatically after X-431 Throttle remains idle over the preset standby time.

3.5.2 Unlock the screen

Press [POWER] to activate the screen and drag the lock to “Unlock” position.

*Note: If you define as unlock using the pattern, you have to draw the right target pattern to unlock it.

3.6 Screen Layout

1. Preview the screen

Tap and hold any blank area on the home screen, a function menu will pop up at the bottom of the screen. It mainly includes wallpapers, lock screen wallpapers, widgets, settings and apps.

2. On-screen buttons

There are 6 on-screen buttons available on the bottom of the screen.

- **Back:** Tap to return to the previous screen.
- **Home:** Tap to jump to the Android’s home screen.
- **Recent App:** Tap to view the recently launched applications and running applications.
- **Screenshot:** Tap to capture the current screen.
- **Downloadable:** Once some upgradable diagnostic software is detected, the icon will turn highlighted.
- **VCI Connection :** Shows whether the VCI device is properly connected or not.

3.7 Adjust Brightness

Tips: Reducing the brightness of the screen is helpful to save the power of X-431 Throttle.

1. On the home screen, tap **Settings -> Display -> Brightness level**.
2. Drag the slider to adjust it.

3.8 Set Standby Time

If no activities are made within the defined standby period, the screen will be locked automatically and the system enters sleep mode to save power.

1. On the home screen, tap **Settings -> Display -> Sleep**.
2. Choose the desired sleep time.

3.9 Changing Language

X-431 Throttle supports multiple languages.

To change the language of the handset, please do the following:

1. On the home screen, tap **Settings -> Language & Input -> Languages**.
2. Tap "**Add a language**", and then choose the desired language from the list.
3. Tap and hold the desired language and drag it to the top of the screen and then release it, the system will change into the target language.

3.10 Wi-Fi Setup

Note: Once WLAN is set as ON, X-431 Throttle will consume more power. While WLAN keeps unused, please turn it off to conserve battery power.

X-431 Throttle has a built-in Wi-Fi module that can be used to get online. Once you're online, you can register your X-431 Throttle, update the diagnostic software & APK, surf the Internet, get apps and send email on your network.

3.9.1 Connect to a Wi-Fi network

1. On the home screen, tap **Settings** -> **WLAN**.
2. Tap or slide the Wi-Fi switch to ON, X-431 Throttle starts searching for all available wireless LANs.
3. Choose the desired Wi-Fi access point / network,
   - If the network you chose is open, you can connect directly;
   - If the selected network is encrypted, you have to enter the right security key (network password).

Once it is connected successfully, tap the Wi-Fi network from the list to view its name, link speed, security type, IP address etc.

3.9.2 Disconnect from a Wi-Fi network

1. On the home screen, tap **Settings** -> **WLAN**.
2. Tap the network with a **Connected** status, then tap "Disconnect".

4 Initial Use

4.1 Getting Started

For new users, please follow the operation chart shown in Fig. 4-1 to start using X-431 Throttle.

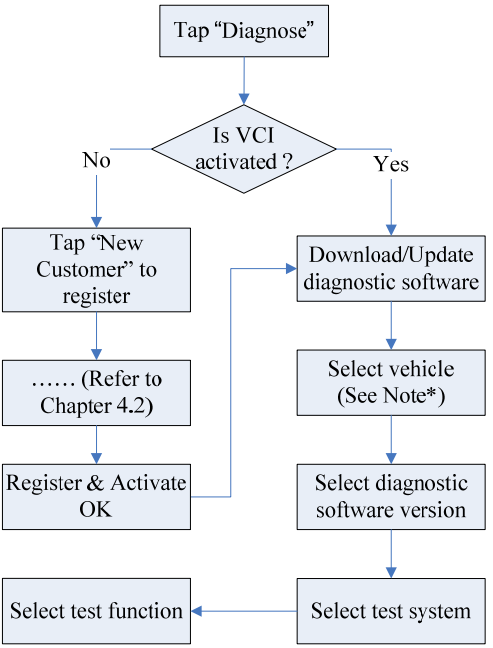


Fig. 4-1

Note*: If "VIN Scan" function is performed, this step shall not apply.

4.2 Register & Download Diagnostic Software

4.2.1 User registration

On the home screen, tap the application icon to launch it, a dialog box similar to the following will pop up on the screen:

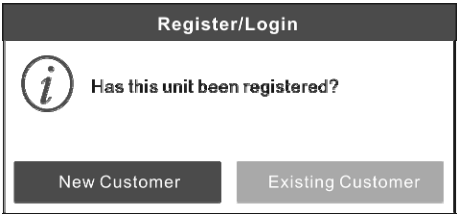


Fig. 4-2

A. If you are a new user, tap “New Customer” in Fig. 4-2 to start your sign-up.

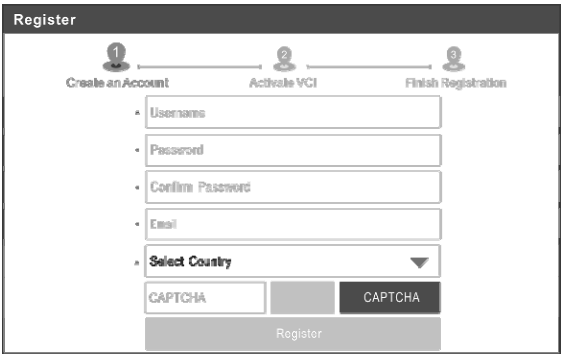


Fig. 4-3

a) Create App Account: In Fig. 4-3, fill in the information in each field (Items with * must be filled). After inputting, tap “Register”, a screen similar to the following will appear:

Fig. 4-4

b) Activate VCI: In Fig. 4-4, input the Serial Number and Activation Code,

which can be found in the password envelope.

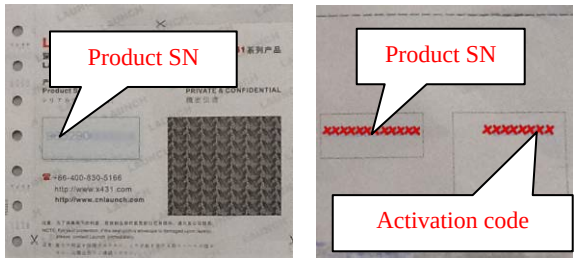


Fig. 4-5

Note: To exit and activate it later, tap “Skip”. In this case, you can activate it by tapping “Activate VCI” in “Settings”.

Tap “Activate” to finish your registration. See Fig. 4-6.

Fig. 4-6

c) Finish Registration: To download the diagnostic software, tap “Yes” to navigate to the download page. Tap “No” to download and install it later.

On the download page, tap “Update” to start downloading. To pause downloading, tap “Stop”. To resume it, tap “Continue”. Once download is complete, the system will install the software package automatically.

Note: In process of download, please make sure the tablet has a strong Wi-Fi signal. It may take several minutes to finish it, please be patient to wait.

B. If you have registered to be a member, tap “Existing Customer” in Fig. 4-2, a screen similar to the following appears:

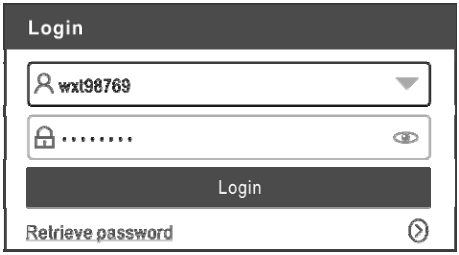


Fig. 4-7

(If you have registered to be a member, go to **a)** to login the system directly.)

(In case you forgot password, refer to **b)** to reset a new password.)

a) If you have registered to be a member, input your name and password, and then tap the "Login" button to enter the main menu screen directly.

Note: The X-431 Throttle has an auto-save function. Once the username and password are correctly entered, the system will automatically store it. Next time you login the system, you will not be asked to input the account manually.

b) If you forgot the password, tap "Retrieve password" and then follow on-screen instructions to set a new password.

4.2.2 Function modules

There are two function modules available on the X-431 Throttle: **Diagnostics** and **Toolbox**. Swipe the screen in from left/right to toggle between them.

Diagnostics mainly includes the following items:

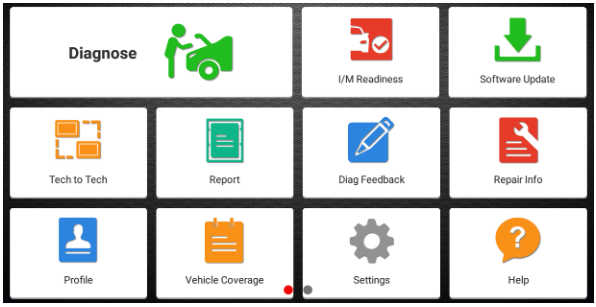


Fig. 4-8

Name	Description
Diagnose	To configures X-431 Throttle to operate as a diagnostic tool.
I/M Readiness	I/M Readiness indicates whether or not the various emissions-related systems on the vehicle are operating properly and are ready for Inspection and Maintenance testing.
Software Upgrade	To update vehicle diagnostic software and APK.
Tech-To-Tech	This option aims to help repair shops or technicians launch instant messaging and remote diagnosis, making the repair job getting fixed faster.
Reports	To manage saved diagnostic reports and records.
Diag. Feedback	To feed back the recent 20 diagnostic logs to us for issue analysis.
Repair Info	Provides quick access to various authorized automotive repair database.
Profile	To manage personal information.
Vehicle Coverage	To view all the vehicle models that the X-431 Throttle covers.
Diagnostic History	Generally once a vehicle diagnosis is performed, X-431 Throttle will automatically record every details of diagnostic session. This function provides a quick access to the tested vehicles and users can resume from the last operation, without the necessity of starting from scratch.
Settings	To make some general system settings, activate VCI, configure printer and print information, clear diagnostic software and backup/restore etc.
Help	Includes FAQ, Quick Start Guide and User Manual.

Toolbox mainly includes the following add-on modules:

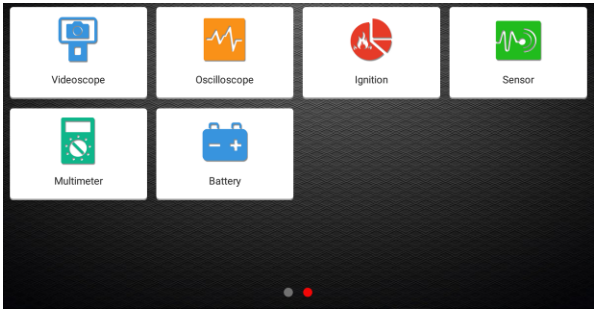


Fig. 4-9

Name	Description
Videoscope	To check unseen or unreachable parts or components.
Oscilloscope/ Ignition	To determine vehicle electrical equipment and circuit trouble.
Sensor	To diagnose/simulate vehicle ECU sensor trouble.
Multimeter	To measure physical parameters such as voltage, resistance, frequency etc. *Note: The function utilizes the same hardware device as the sensor module.
Battery	To test whether vehicle's battery is good or not.

4.2.3 Vehicle menu layout

After downloading the diagnostic software, you can go to “Diagnose” to check if all software are completely downloaded and installed.

Tap “Diagnose”, a screen similar to the following figure appears:

Fig. 4-10

1	**All** Tab: Displays all the vehicle makes in the vehicle menu.
2	Vehicle region buttons: Tap different buttons to switch to corresponding vehicles.
3	**History** (Previous Session): Generally once a vehicle diagnosis is performed, X-431 Throttle will record the every details of diagnostic session. The History function provides direct access to the previously tested vehicles and users can resume from the last operation, without the necessity of starting from scratch.
4	**AutoDetect**: Through simple Bluetooth communication between the X-431 Throttle handset and VCI connector, you can easily get the VIN (Vehicle Identification Number) information of the currently identified vehicle. Once the VIN is successfully identified, the system will retrieve it from the remote server and then guide you to vehicle information page without the necessity of step-by-step manual menu selection.

4.3 Connections

4.3.1 Preparation

Normal testing conditions

- Turn on the vehicle power supply.
- Throttle should be in a closed position.

4.3.2 DLC location

The DLC (Data Link Connector) is typically a standard 16 pin connector where diagnostic code readers interface with the vehicle's on-board computer. The DLC is usually located 12 inches from the center of the instrument panel (dash), under or around the driver's side for most vehicles. If Data Link Connector is not located under dashboard, a label should be there telling location. For some Asian and European vehicles, the DLC is located behind the ashtray and the ashtray must be removed to access the connector. If the DLC cannot be found, refer to the vehicle's service manual for the location.

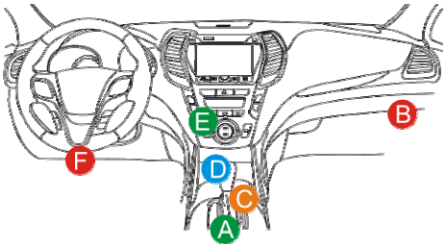


Fig. 4-11

4.3.3 Vehicle connection

The method used to connect the diagnostic connector to a vehicle's DLC depends on the vehicle's configuration as follows:

- A vehicle equipped with an OBD II management system supplies both communication and 12V power through a standardized DLC.
- A vehicle not equipped with an OBD II management system supplies communication through a DLC connection, and in some cases supplies 12V power through the cigarette lighter receptacle or a connection to the vehicle battery.

Follow the steps mentioned below to connect OBD II vehicle:

1. Locate vehicle's DLC socket.
2. Plug the VCI connector into the vehicle's DLC socket (It is suggested to use the OBD II extension cable to connect the VCI connector and DLC socket.).
3. Choose one of the two ways to obtain power from:
   A. Power adaptor: Connect one end of the included power adaptor to DC IN port of X-431 Throttle tablet, and the other end to AC outlet.
   B. Internal battery pack

For non-OBDII vehicle, proceed as follows:

1. Locate vehicle's DLC socket.
2. Select the corresponding non-16pin connector.
3. Plug the non-16pin end of the connector into the DLC socket, and the other end to the OBD I adaptor, and then tighten the captive screws.
4. Connect the other end of the adaptor to the included VCI connector.
5. To supply power to OBD I adaptor from:

   A. Cigarette Lighter Cable: Connect one end of the cigarette lighter cable to vehicle's cigarette lighter receptacle, and the other end to the power jack of

OBD I adaptor.

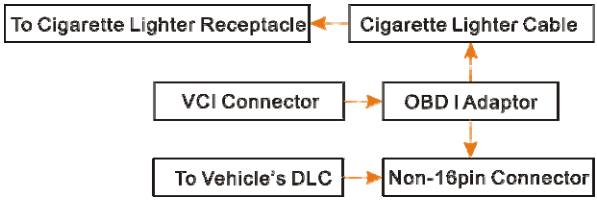


Fig. 4-12

B. Battery Clamps Cable: Connect one end of the battery clamps cable to vehicle's battery, and the other end to the power jack of OBD I adaptor.

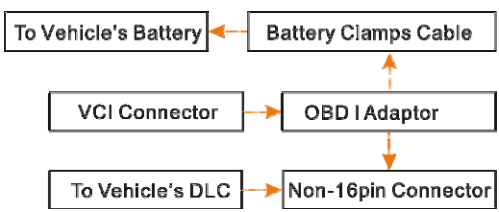


Fig. 4-13

4.4 Communication Setup

There are two kinds of ways available for X-431 Throttle to pair with the VCI device.

4.4.1 Pairing up via wireless (BT) communication

1. Connect one end of the USB cable (optional) to the Mini USB port of the VCI device.
2. Connect the other end to the USB port of the PC. The power indicator of the VCI lights up.
3. Enter Bluetooth setting screen by tapping "Settings" -> "Bluetooth", slide the Bluetooth switch to ON and X-431 Throttle starts searching for all available Bluetooth device.
4. Tap the desired VCI to pair and match. By default, the Bluetooth ID of the VCI is 98********00 (where ******** stands for 8 digits).
5. If the Bluetooth pair request pops up on the screen, enter the request pin code (default code: 0000 or 1234).

6. Once the VCI is paired with the handset, it will be shown under the paired device tab.

Note: In case no Bluetooth setting is done before diagnostic software is launched, you can also configure it in process of vehicle diagnosis.

4.4.2 USB cable connection

The USB cable connection is a simple & quick way to establish communication between the handset and the VCI device. After properly connecting the USB cable from the handset to the VCI, the VCI navigation button at the bottom of the screen becomes highlighted, indicating the USB connection is successful.

*Note: The USB connection provides the most stable and fastest communication. When all communication methods are applied at the same time, the X-431 Throttle system will use the USB communication as the default priority.

5 Diagnosis

X-431 Throttle supports two kinds of diagnosis methods: Smart Diagnosis (AutoDetect) and Manual Diagnosis.

5.1 Intelligent Diagnosis (AutoDetect)

Through simple Bluetooth communication between the X-431 Throttle handset and VCI device, you can easily get the VIN (Vehicle Identification Number) information of the currently identified vehicle. Once the VIN is successfully identified, the system will retrieve it from the remote server and then guide you to vehicle information page without the necessity of step-by-step manual menu selection.

The vehicle information page lists all historical diagnostic records of the vehicle, which lets the technician have a total command of the vehicle faults. In addition, a quick dial to local diagnosis and diagnostic function are also available on this page for reducing the roundabout time and increasing productivity.

Notes:

- Before using this function, please make sure the VCI device is properly connected to the vehicle's DLC. For detailed connection, see Chapter 4.3.3 "Vehicle Connection".
- A stable network connection is required for this function.

Follow the steps below to proceed.

1. Tap "Diagnose" on the Diagnostics function module and tap "AutoDetect" to enter Fig. 5-1.

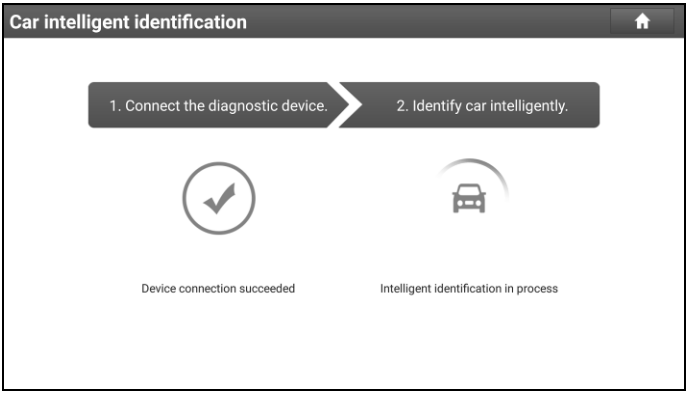


Fig. 5-1

Note: If the VCI connector is not paired up with the X-431 Throttle handset before doing this step, a prompt message box will appear:

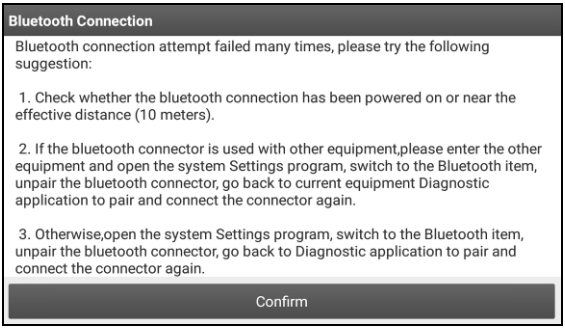


Fig. 5-2

Check all the possible reasons of Bluetooth connection failure carefully, and then tap “Confirm”.

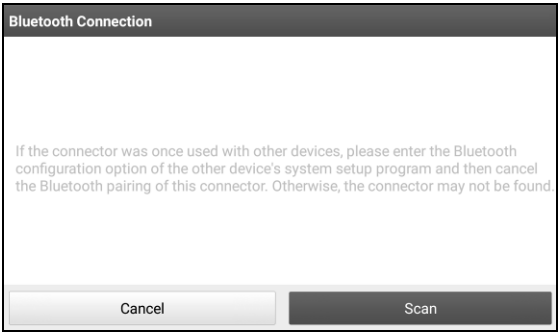


Fig. 5-3

If the VCI connector was once used with other devices, you need to cancel the pairing of the connector first via either one of the following ways:

- On the Android's home screen, tap "Settings" -> "Bluetooth" -> Choose the desired VCI connector from the Paired list. Tap "⚙", and then tap "FORGET" to unpair it.
- Tap "Settings" -> "VCI Management" -> Tap "Deactivate matching".

Tap "Scan" to start searching for the VCI connector and pairing up with it.

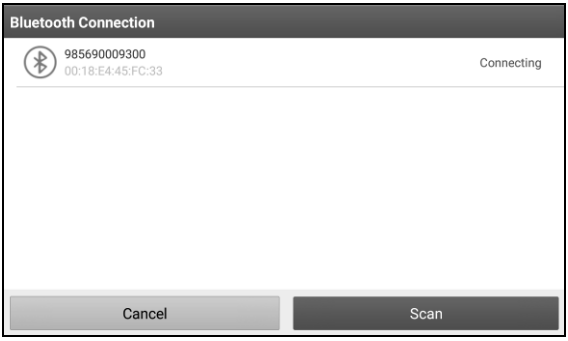


Fig. 5-4

2. Once pairing is complete, the handset starts reading the vehicle VIN.

A. <u>If the VIN can be found from the remote server database</u>, a screen similar to Fig. 5-5 displays:

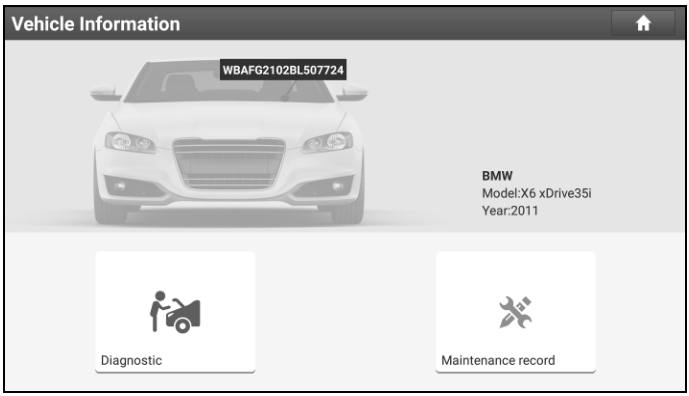


Fig. 5-5

- Tap “Diagnostic” to start a new diagnostic session.
- Tap “Maintenance record” to view its historical repair record. If there are records available, it will be listed on the screen in sequence of date. If no records exist, the screen will show “No Record”.

Fig. 5-6

- Tap “View record” to view the details of the current diagnostic report.
- To perform other functions, tap “Quick access” to directly go to the function selection screen. Choose the desired one to start a new diagnostic session.

B. If the handset failed to access the VIN information, the screen will display as below:

Fig. 5-7

In this mode, you need to input the VIN manually or tap to scan it.

1) Tap "" to launch the VIN recognition module.

Fig. 5-8

Place the VIN inside the viewfinder rectangle to scan it. The most recognizable location for this number is in the top left corner on the vehicle's dashboard. Other locations include the driver's door or post, and the firewall under the hood.

- If you have scanned the VIN of the vehicle, tap to choose it from the record list.
- In case the handset failed to detect it, tap to enter it manually.
- To turn the flash on, tap .

After scanning, the screen automatically displays the result.

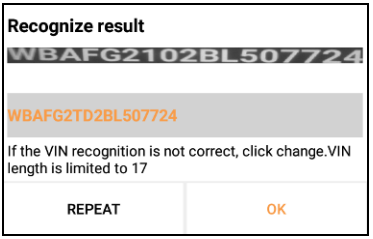


Fig. 5-9

- If the VIN scanned is incorrect, tap the result field to modify it and then tap “OK”. If the VIN exists on the remote server, the system will enter the vehicle information screen. See Fig. 5-5.
- To scan it again, tap “REPEAT”.

2) Input the VIN, and tap “OK”, the system will automatically identify the vehicle model and directly navigate to the vehicle information page.

   In general, vehicle identification numbers are standardized - all contain 17 characters. VIN characters may be capital letters A through Z and numbers 1 through 0; however, the letters I, O and Q are never used in order to avoid mistakes of misreading. No signs or spaces are allowed in the VIN.

   Tap “SKIP” to go to Diagnostics main menu screen.

5.2 Manual Diagnosis

In this mode, you need to execute the menu-driven command and then follow the on-screen instruction to proceed.

Take Demo as an example to demonstrate how to diagnose a vehicle.

1). Select diagnostic software version: Tap the “DEMO” to go to Step 2. (Note: If more than one version is available on this handset, it will be listed on the screen.)

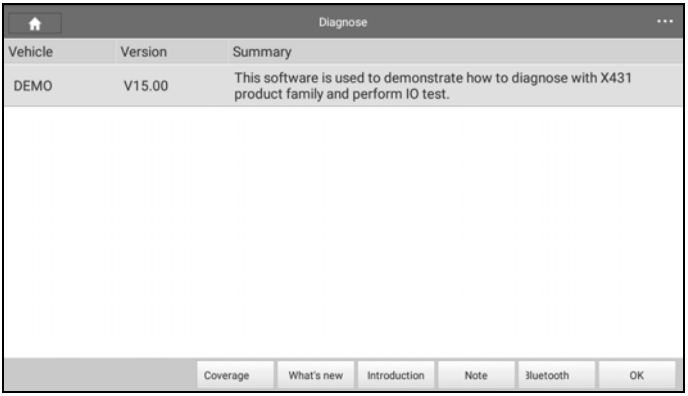


Fig. 5-10

On-screen Buttons:

Vehicle Coverage: Tap to view the vehicle models that the current diagnostic software covers.

What's new: Tap to view the optimized items and enhancements.

Introduction: Tap to check the software function list.

Note: Tap to read some precautions on using the current diagnostic software.

Bluetooth: Tap to search for the available VCI Bluetooth connector.

Notes:

- No Bluetooth connection is required for DEMO program.
- If a vehicle is tested and no Bluetooth connection is made before diagnosis, tap "Search Bluetooth", a dialog box similar to the following appears:

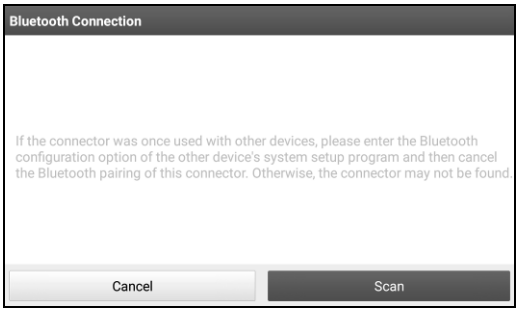


Fig. 5-11

Tap “Scan” to start searching for the VCI device. Once it is found, tap it to start pairing.

If the X-431 Torque handset has paired with the VCI device, it will enter Step 2 directly.

OK: Tap it to go to next step.

2). Select test item: Select the desired test item to proceed.

Fig. 5-12

5.2.1 Health Report (Quick Test)

This function varies from vehicle to vehicle. It enables you to quickly access all the electronic control units of the vehicle and generate a detailed report about vehicle health.

Tap “Health Report”, the system start scanning the ECUs. Once the scanning is complete, a screen similar to the following appears:

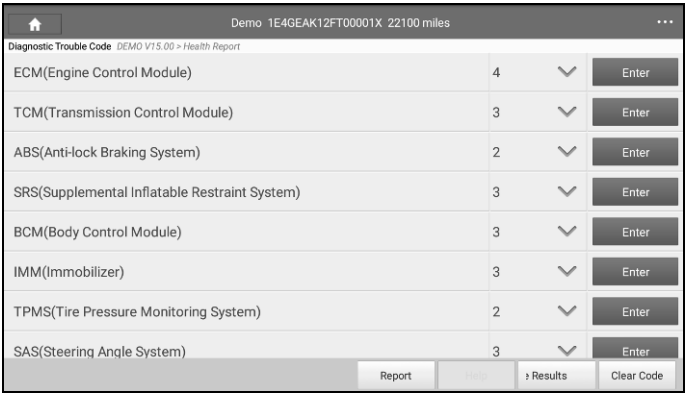


Fig. 5-13

In Fig. 5-13, the tested system with fault code appears in red and the system with OK displays in black (normally).

Tap ⌄ to view all diagnostic trouble codes.

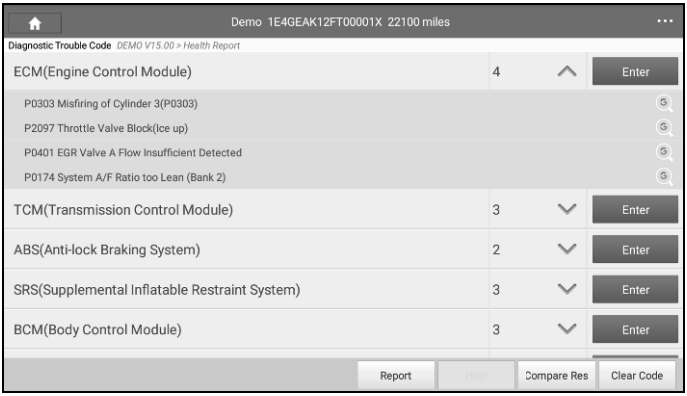


Fig. 5-14

On-screen Buttons:

Search **:** Highlight a certain DTC item, and then tap it to launch the browser to search for more detailed information about the selected DTC online.

Report: To save the current data in text format.

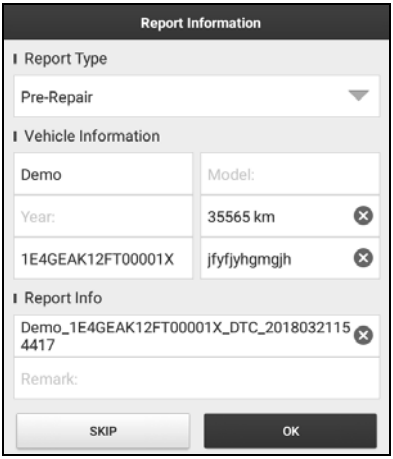


Fig. 5-15

Choose the report type and input the required information, and then tap “OK”.

Fig. 5-16

Enter the tester and customer name and then tap “OK” to save it.

For workshop information, tap “Modify” to revise it. Alternatively you can also set the workshop information in “Settings” -> “Print Information”.

Once you configured the information, it will be automatically generated every time you saved the diagnostic report. All vehicle and workshop information will be appended as tags on the diagnostic report, which allows you to easily retrieve the desired report while performing “Filter” function of Diagnostic Report.

To skip the workshop information, tap “Skip” to go to the next step.

All reports are saved under the “Diagnostic Report” tab in “Reports” on the “Diagnostic” function module. For details on report operations, please refer to Chapter 5.4.

Compare Results: Tap to select the pre-repair report to compare. By comparison of the pre- and post- repair reports, you can easily identify which DTCs are cleared and which remain unfixed.

*Note: Before performing this function, please make sure that:

- You have saved a pre-repair report of the currently tested vehicle; and
- You have already made some repairs and service and cleared the DTCs after the pre-repair reported is generated. Otherwise, no differences exist between the pre- and post- repair reports.

5.2.2 System Scan

This option allows you to quickly scan which systems are installed on the

vehicle.

In Fig. 5-12, tap “System Scan”, the system start scanning the systems. Once the scanning is complete, the screen will display the result. See Fig. 5-17.

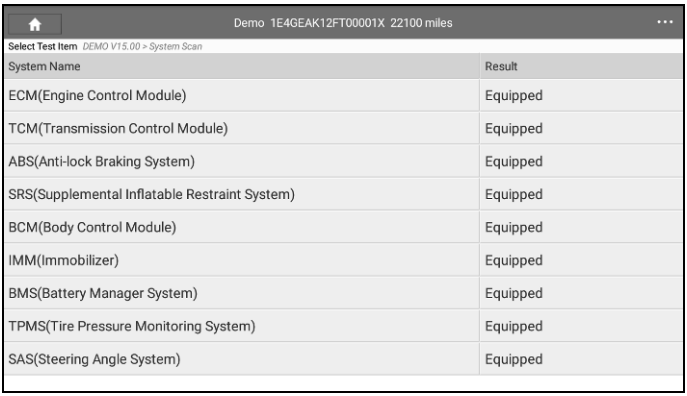


Fig. 5-17

Tap the desired system to advance to the test function selection page. For detailed operations on test function, please refer to Chapter 5.2.3.

5.2.3 System Selection

This option allows you manually select the test system and function step by step.

In Fig. 5-12, tap “System Selection”, the screen displays as follows:

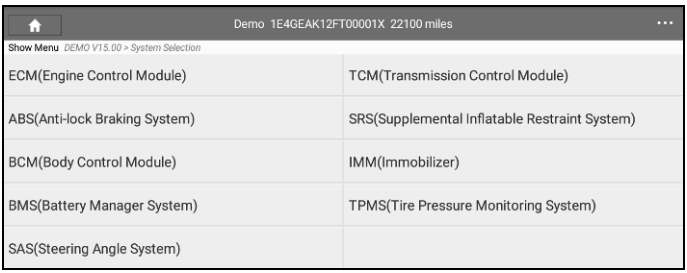


Fig. 5-18

Swipe the screen from the bottom to view the vehicle system on the next page.

Tap the desired system (take “ECM” for example) to jump to the test function page.

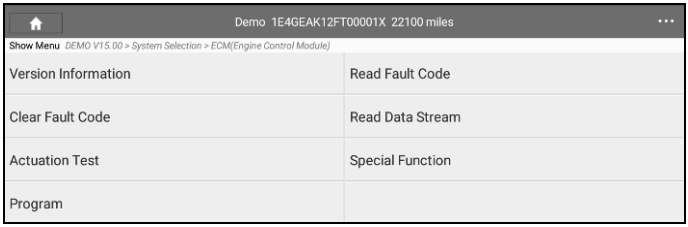


Fig. 5-19

Note: Different vehicle has different diagnostic menus.

A. Version Information

This function is used to read the version information of system mode, vehicle VIN, software and ECU.

B. Read Fault Code

This function displays the detailed information of DTC records retrieved from the vehicle's control system.

In Fig. 5-19, tap "Read Fault Code", the screen will display the diagnostic result.

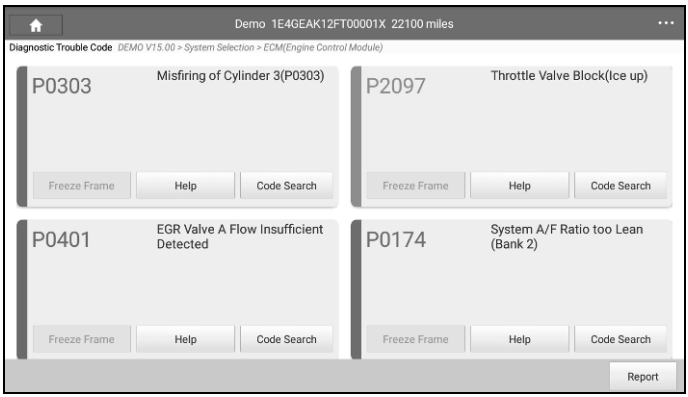


Fig. 5-20

On-screen Buttons:

Freeze Frame: When an emission-related fault occurs, certain vehicle conditions are recorded by the on-board computer. This information is referred to as freeze frame data. Freeze frame data includes a snapshot of critical

parameter values at the time the DTC is set.

Help: Tap to view the help information.

Code Search: Tap it to search for more information about the current DTC online.

Report: To save the current data in text format. All reports are saved under the tab “Diagnostic Report” in “Report” on the “Diagnostics” function module. For details on report operations, please refer to Chapter 5.4.

C. Clear Fault Code

After reading the retrieved codes from the vehicle and certain repairs have been carried out, you can use this function to erase the codes from the vehicle. Before performing this function, please be sure the vehicle’s ignition key is in the ON position with the engine off.

In Fig. 5-19, tap “Clear Fault Code”, a confirmation dialog box pops up on the screen.

Tap “Yes”, the system will automatically delete the currently existing trouble code.

Note: The trouble code will not disappear until the trouble was completely cleared.

D. Read Data Stream

This option retrieves and displays live data and parameters from the vehicle’s ECU.

In Fig. 5-19, tap “Read Data Stream”, the system will display data stream items.

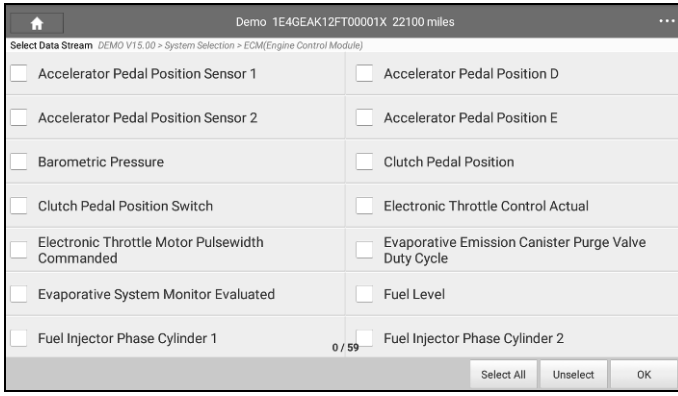


Fig. 5-21

On-screen Buttons:

Select All: Tap it to select all items of the current page. To select certain data stream item, just check the box before the item name.

Unselect: Tap it to deselect all data stream items.

OK: Tap it to confirm and jump to the next step.

After selecting the desired items, tap “OK” to enter the data stream reading page.

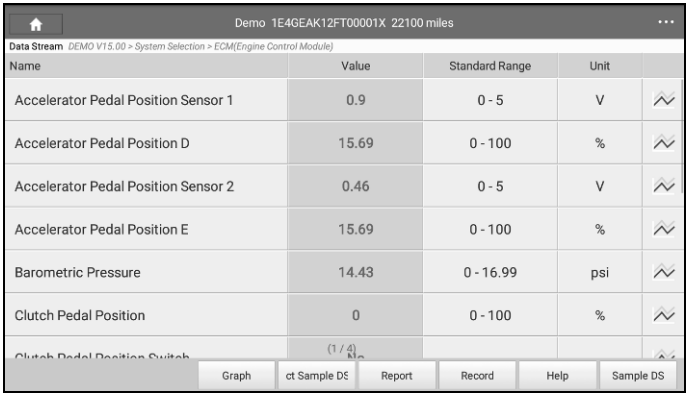


Fig. 5-22

Notes:

1. If the value of the data stream item is out of the range of the standard (reference) value, the whole line will display in red. If it complies with the reference value, it displays in blue (normal mode).
2. The indicator 1/X shown on the bottom of the screen stands for the current page/total page number. Swipe the screen from the right/left to advance/return to the next/previous page.

There are 3 types of display modes available for data viewing, allowing you to view various types of parameters in the most suitable way.

- ✓ Value – this is the default mode which displays the parameters in texts and shows in list format.
- ✓ Graph – displays the parameters in waveform graphs.

✓ Combine – this option is mostly used in graph merge status for data comparison. In this case, different items are marked in different colors.

On-screen Buttons:

Single graph: Tap it to view the waveform.

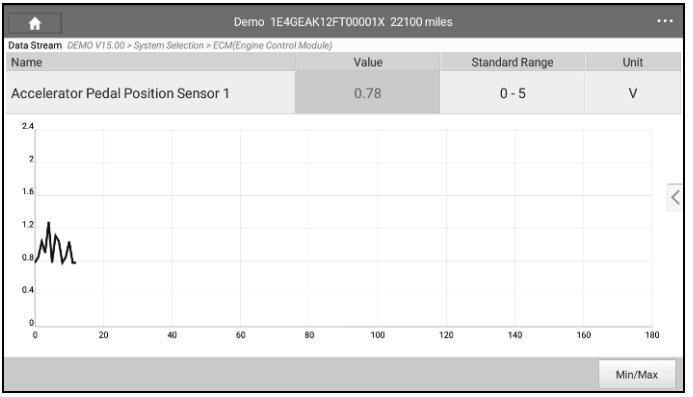


Fig. 5-23

- **Min/Max**: Tap "Min/Max" to define the maximum/minimum value. Once the value goes beyond the specified value, the system will alarm.

Graph: Tap it to view the waveform.

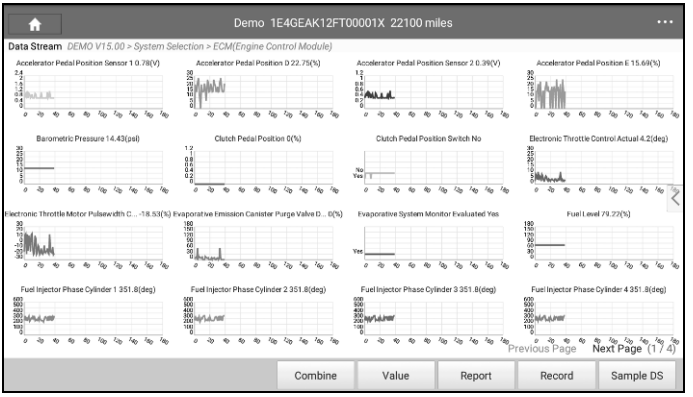


Fig. 5-24

- **Combine**: This option is mostly used in graph merge status for data comparison.
- **Value**: Tap to display the parameters in texts.
- **Customize** (): Tap it, a pull-down list of the data stream items appears on the screen. Select (Maximum 8 data stream items can be selected)/deselect the desired items and then screen will display/remove the waveforms corresponding to these items immediately.

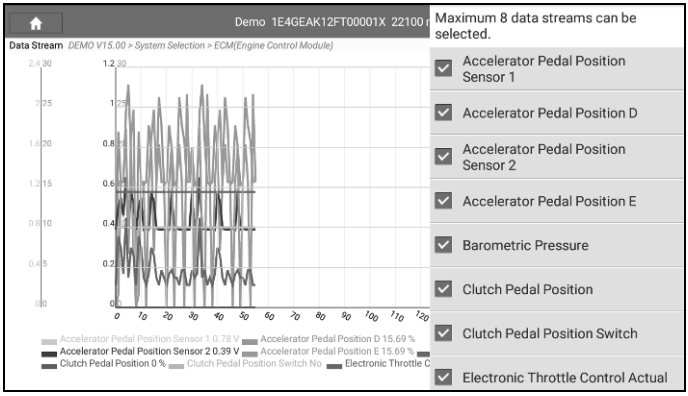


Fig. 5-25

Select Sample DS: Tap it to select the sample DS file, the values you customized and saved in process of DS sampling will be imported into the “Standard Range” column for your comparison.

*Before executing this function, you have to sample the values of data stream items and save it as a sample DS file.

Report: To save the current data in text format. All reports are saved under the tab “Diagnostic Report” in “Report” on the “Diagnostics” function module. For details on report operations, please refer to Chapter 5.4.

Record: Tap to start recording diagnostic data for future playback and analysis. The saved file follows the naming rule: It begins with vehicle type, and then the record starting time and ends with .x431 (To differentiate between files, please configure the accurate system time). The file is stored in “Report” on the “Diagnostics” function module.

Help: Tap to view the help information.

Sample DS: This item enables you to customize the standard range of live data stream items and save it as DS sample file. Each time you run the data stream items, you can call out the corresponding sample data to overwrite the current standard range.

Tap it to start recording the sample data (* Only data stream items with units will be recorded), and the screen displays as below:

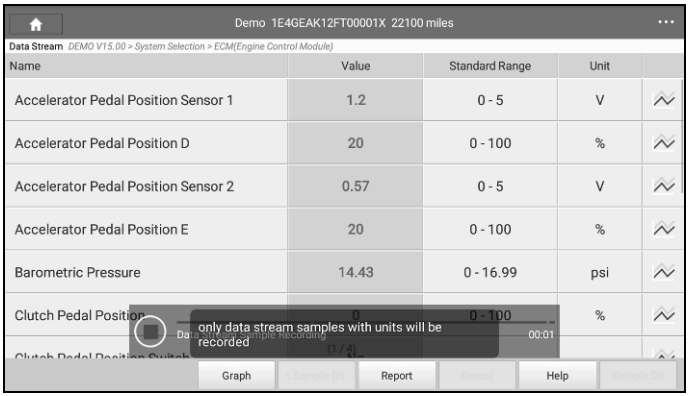


Fig. 5-26

Once recording is complete, tap ■ to stop it and navigate to the data modification screen.

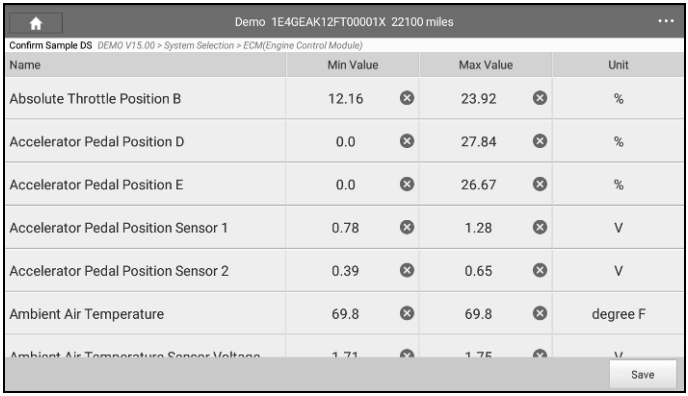


Fig. 5-27

Tap the Min./Max. value to change it. After modifying all desired items, tap “Save” to save it as a sample DS file. All DS files are stored under the “Data Stream Sample” file in “User Info”.

E. Actuation Test

This option is used to access vehicle-specific subsystem and component tests. Available test vary by vehicle manufacturer, year, and model.

During the actuation test, the X-431 Torque handset outputs commands to the ECU in order to drive the actuators, and then determines the integrity of the system or parts by reading the ECU data, or by monitoring the operation of the actuators, such as switching a injector between two operating states.

In Fig. 5-19, tap “Actuation Test”, the system will display as follows:

Fig. 5-28

Simply follow the on-screen instructions and make appropriate selections to complete the test. Each time when an operation is successfully executed, “Completed” displays.

5.3 Tech to Tech (Remote Diagnosis)

This option aims to help repair shops or technicians launch instant messaging and remote diagnosis, making the repair job getting fixed faster.

Tap “Tech to Tech” on the Diagnostics function module, the screen appears

blank by default.

5.3.1 Interface layout

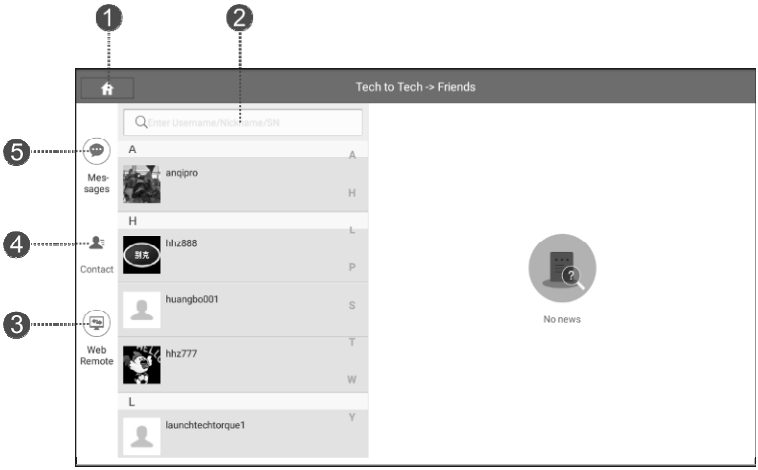


Fig. 5-29

1	Home button	Tap to navigate to the Job menu.
2	Search bar	Directly input the username of the X-431 Throttle to start searching, and then tap the desired one to add it into your friend list.
3	WEB Remote switch	Tap to slide the switch to ON, the X-431 Throttle keeps online and becomes visible on the web client. In this case, inform the technician of your product S/N, and he/she will control your X-431 Throttle remotely.
4	Contact tab	Tap to enter the friend list. By default it appears blank.
5	Message tab	Once an incoming message reaches, a red dot will appear on the upper right corner of the tab.

5.3.2 Add Friends

Tap “Contact” to enter the contact page. By default it appears blank.

In the search bar, input the partner’s username and tap “Search” button next to

the search bar to starts searching from golo business database.

The partner must be the users who have registered their Launch's diagnostic tools. They may be the following:

- Workshop
- Technician
- golo users

Once the result matches the keyword, tap the desired one from the search result to enter the instant messaging mode.

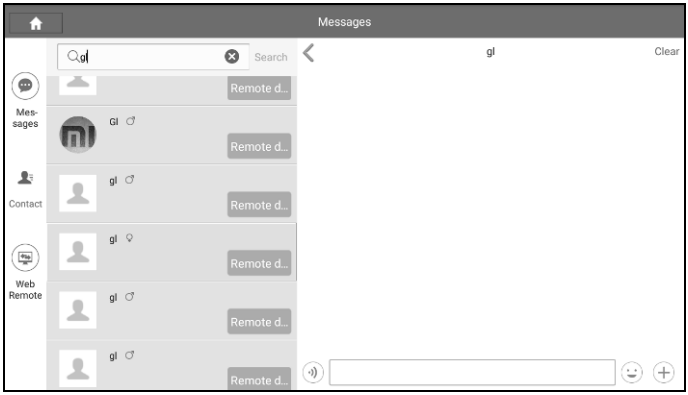


Fig. 5-30

Tap "⊕" and select "Add Friend" from the option menu, a dialog box pops up.

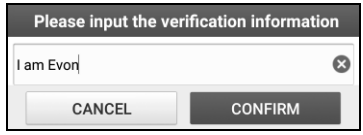


Fig. 5-31

Tap "CONFIRM" to send your request.

Once the partner receives the request, a beep will sound. Tap the "Message" tab:

- Once the partner agreed your request, he/she will automatically be listed in the Contact tab.
- If a technician sent you a friend request, you can tap "Agree" to confirm and

his/her name will appear in the friend list (Contact). Or tap “Ignore” to ignore this request.

5.3.3 Start instant messaging

Note: The I/M (Instant Messaging) function is open to all users who had Launch’s diagnostic tool equipped with this module.

After adding your friends, tap the desired one’s photo to enter a screen similar to the following:

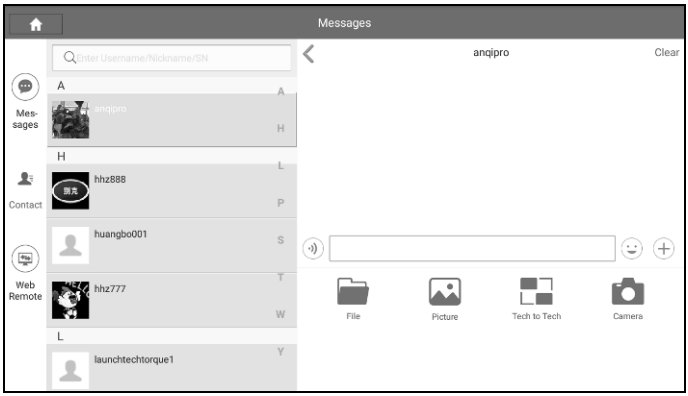


Fig. 5-32

Tap the input field and use the on-screen keyboard to enter the text message, and then tap “Send” to send it.

Tap to send the voice message.

Tap to send the emoj.

Tap to call out more function options.

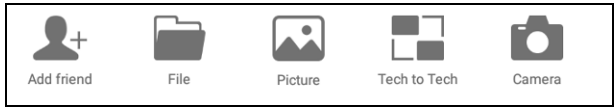


Fig. 5-33

File: Choose diagnostic reports or local files to send.

Picture: Choose screenshots or pictures to send.

Tech to Tech: To start a remote diagnostic session. For details, refer to Chapter

5.3.4.

Camera: Open camera to take pictures.

5.3.4 Launch remote diagnosis (Device-To-Device)

The X-431 Throttle handset is allowed to launch remote diagnosis with other diagnostic tools (including but not limited to the X-431 Throttle) of Launch family, which are equipped with this module.

* Note: Before performing this operation, please make sure the following no matter which side sends the remote request:

- Turn on the vehicle power supply.
- Throttle should be in a closed position.
- The X-431 Throttle should be properly connected to the vehicle's DLC and a successful communication is required.

In Fig. 5-33, tap "Tech to Tech", a pull-down menu including the following options appears:

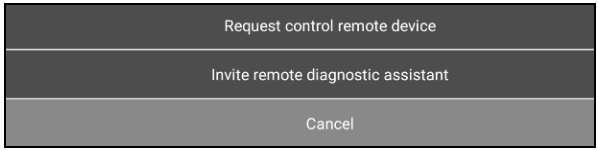
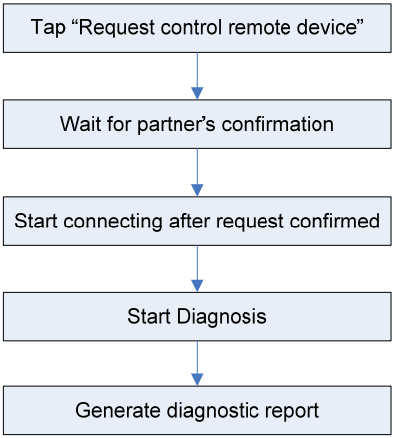
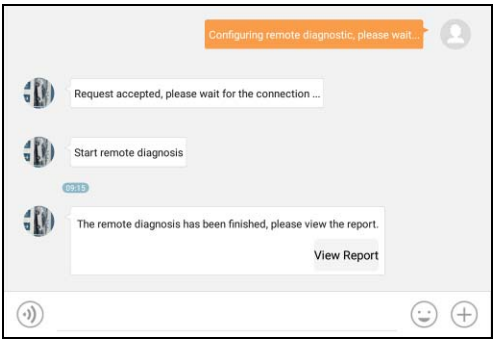


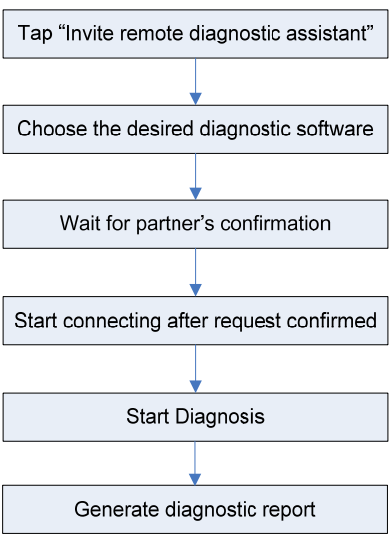
Fig. 5-34

These options are defined as follows:

Actions	Results
Send remote diagnostic reservation	Tap it and input the reservation title or scheduled date of the remote diagnosis, and then tap "Confirm" to send.
Request control remote device	Request to control the partner's device remotely to help him diagnose the vehicle. *Notes: • Remote diagnosis has the same diagnostic steps as manual diagnosis. • In process of remote diagnosis, tap the button to send a voice message. • Once vehicle diagnosis is complete, a report will be

	created. Input your comments on this report, and then tap “Send Report” to send it to the partner. 
Invite remote diagnostic assistant	If you need support, just use this option to invite a technician to perform a remote control on your tool. *Notes: • Remote diagnosis has the same diagnostic steps as manual diagnosis. • In process of remote diagnosis, tap the button to send voice message. • Once you received the report from the partner, tap “View Report” to view details. All diagnostic reports are saved under the “Remote Diagnostic Reports” tab of “My Reports” in “User Info”.

<table>
<tr><td></td><td>




</td></tr>
<tr><td>Cancel</td><td>To cancel this operation.</td></tr>
</table>

5.3.5 Launch remote diagnosis (Device-To-PC)

Except that the remote diagnosis can be done between different Launch's diagnostic tools that come loaded with the module, user also can ask for remote control from PC client technician.

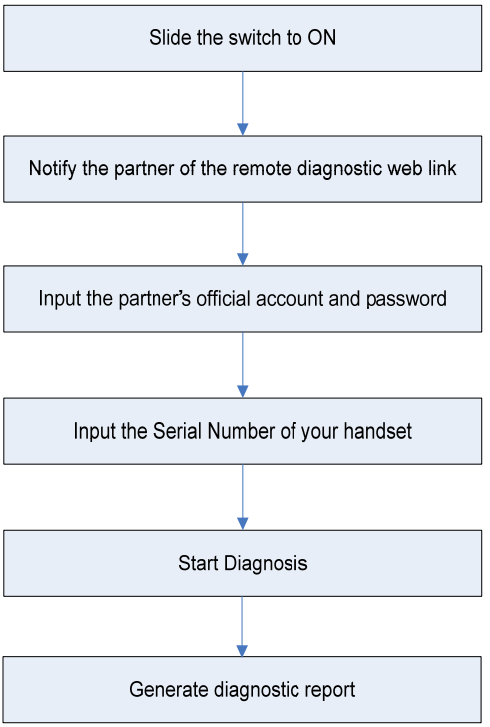


Fig. 5-35

Tap the "Web Remote" tab, the screen displays as follows:

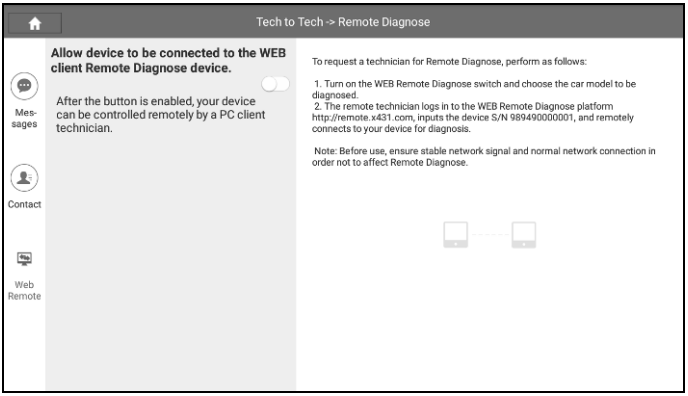


Fig. 5-36

1. Slide the switch “Allow device to be connected to the WEB client remote diagnostic device” to ON so that the partner can find and access to this device while using the PC.
2. Notify the partner of the PC client website http://remote.x431.com. When the partner opens the link, the PC displays as below:

   *Note: Before processing remote diagnosis, please make sure the X-431 Throttle handset is properly connected to the vehicle.

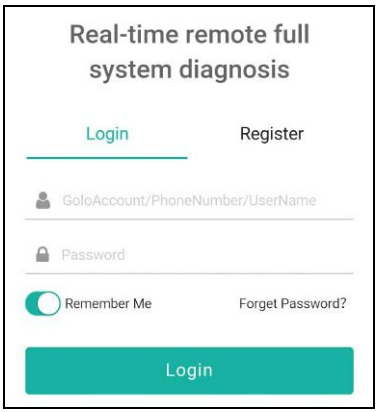


Fig. 5-37

3. Tell the partner to input his own official technician account and password, and then tap “Login” to navigate to the following figure.

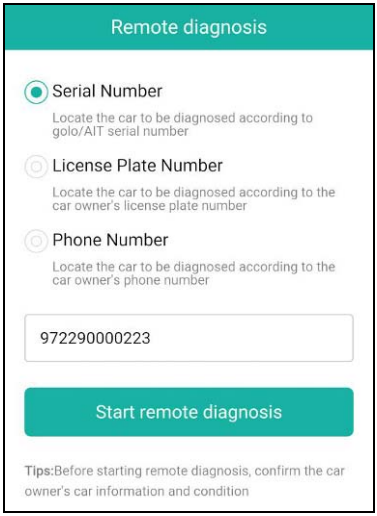


Fig. 5-38

4. Tell the partner to check the box “Serial number” and enter the Serial Number provided by you, and then tap “Start remote diagnosis”.
5. A popup displays to ask for your confirmation to allow remote control on your device.
6. Tap “Allow” to accept, or tap “Deny” to reject.

   In process of remote diagnosis, please note the following things:

   1) You are not suggested to execute any actions.

   2) The partner is not allowed to save any diagnostic reports or records on your handset.

The operations in remote diagnosis are same as those in local diagnosis. Once the session is complete, a remote diagnostic report will be automatically generated.

5.4 Manage Reports

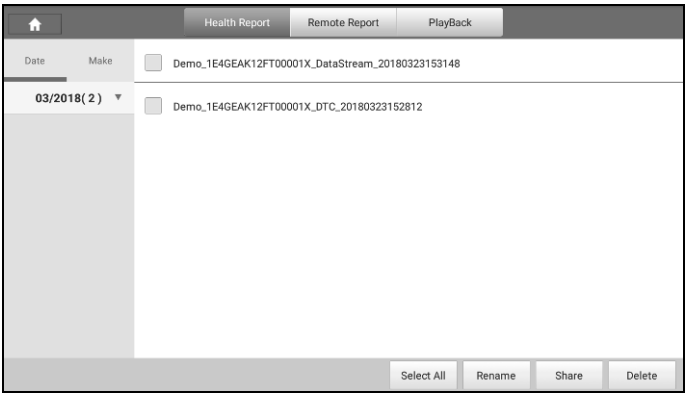


Fig. 5-39

5.4.1 Health Report

This module stores all diagnostic reports generated in process of vehicle diagnosis.

All the diagnostic reports are sorted by Date and Make. Tap the desired type to re-arrange and filter it.

- To select certain report, check the box before the report. To select all reports, tap “Select All”. To deselect all, tap “Unselect”.
- To revise the filename of the report, select the desired one and tap “Rename”.
- To share the report with others, select the desired one and then tap “Share”.
- Select the desired report and then tap “Delete” to delete it.

5.4.2 Remote Report

This option lists all diagnostic reports generated in process of remote diagnostics.

5.4.3 Playback

If user records the running parameters or waveform graphs while reading data stream, it will be saved as diagnostic records and appear under this tab.

Tap “Playback”, and select certain diagnostic record to enter.

Select the desired data stream items and tap “OK” to jump to the playback page.

On-screen Buttons:

Graph – displays the parameters in waveform graphs.

Combine – this option is mostly used in graph merge status for data comparison. In this case, different items are marked in different colors.

Value – this is the default mode which displays the parameters in texts and shows in list format.

Frame Playback – plays back the recorded data stream items frame by frame. Once it is in frame playback mode, this button changes into “Auto Playback”.

5.5 I/M Readiness

An important part of a vehicle’s OBD II system is the Readiness Monitors, which are indicators used to find out if all of the emissions components have been evaluated by the OBD II system. They are running periodic tests on specific systems and components to ensure that they are performing within allowable limits.

Currently, there are eleven OBD II Readiness Monitors (or I/M Monitors) defined by the U.S. Environmental Protection Agency (EPA). Not all monitors are supported in every vehicles and the exact number of monitors in any vehicle depends on the motor vehicle manufacturer’s emissions control strategy.

Continuous Monitors -- Some of the vehicle components or systems are continuously tested by the vehicle’s OBD II system, while others are tested only under specific vehicle operating conditions. The continuously monitored components listed below are always ready:

1）Misfire

2）Fuel System

3）Comprehensive Components (CCM)

Once the vehicle is running, the OBD II system is continuously checking the above components, monitoring key engine sensors, watching for engine misfire, and monitoring fuel demands.

Non-Continuous Monitors -- Unlike the continuous monitors, many emissions and engine system components require the vehicle to be operated under specific conditions before the monitor is ready. These monitors are termed non-continuous monitors and are listed below:

1) EGR System

2) O2 Sensors
3) Catalyst
4) Evaporative System
5) O2 Sensor Heater
6) Secondary air Injection
7) Heated Catalyst
8) A/C system

I/M refers to Inspection and Maintenance that is legislated by the Government to meet federal clean-air standards. I/M Readiness indicates whether or not the various emissions-related systems on the vehicle are operating properly and are ready for Inspection and Maintenance testing.

The purpose of the I/M Readiness Monitor Status is to indicate which of the vehicle's Monitors have run and completed their diagnosis and testing, and which ones have not yet run and completed testing and diagnosis of their designated sections of the vehicle's emissions system.

The I/M Readiness Monitor Status function also can be used (after repair of a fault has been performed) to confirm that the repair has been performed correctly, and/or to check for Monitor Run Status.

Tap [I/M Readiness] on the Job Menu to start checking. After checking all I/M readiness status, the screen will output the result:

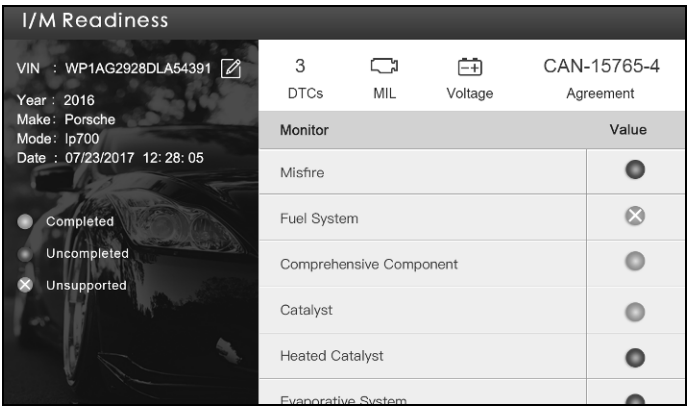


Figure 5-40

Note: ⊗ means not available on this vehicle, ● means incomplete or not ready, ● means Completed or Monitor Ok.

5.6 How to View Diagnostic History?

Generally once a vehicle diagnosis is performed, X-431 Throttle will record the every details of diagnostic process. The History function provides direct access to the previously tested vehicles and users can resume from the last operation, without the necessity of starting from scratch.

Tap “History” on the Diagnose main menu screen, all diagnostic records will be listed on the screen in date sequence.

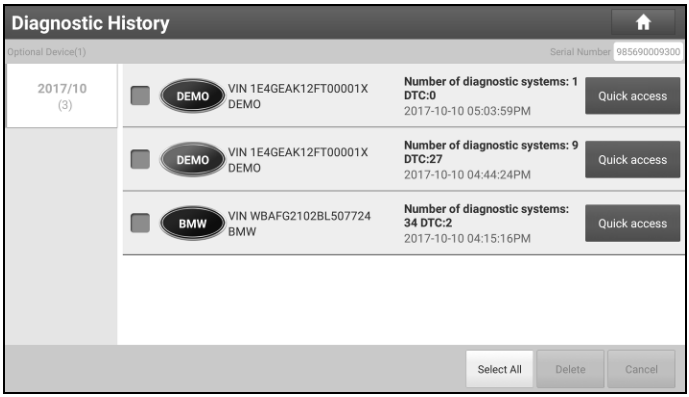


Fig. 5-41

- Tap certain vehicle model to view the details of the last diagnostic report.
- To delete certain diagnostic history, select it and then tap “Delete”. To delete all historical records, tap “Select All” and then tap “Delete”.
- Tap “Quick access” to directly navigate to the function selection page of last diagnostic operation. Choose the desired option to proceed.

5.7 Diagnostic Feedback

This item allows you to feedback your diagnostic problems to us for analysis and troubleshooting.

Tap “Diag. Feedback”, the following 3 options will be displayed on the left column of the screen.

A. Feedback

Tap a tested vehicle model to enter the feedback screen.

1) Tap “Choose File” to open the target folder and choose the desired diagnostic logs.
2) Choose the failure type and fill in the detailed failure description in the blank text box and telephone or email address. After inputting, tap “Submit Result” to send it to us.

B. History

Tap it to view all diagnostic feedback records. Different process states are marked with different colors.

C. Offline list

Tap it to display all diagnostic feedback logs which have not been submitted successfully due to network failure. Once the handset gets a stable network signal, it will be uploaded to the remote server automatically.

5.8 View Repair Information

This feature provides a quick dial to some authoritative official automotive repair websites for your reference and retrieval. Meanwhile, it also allows you to add some frequently used websites into Favorites so that you can quickly access them in future.

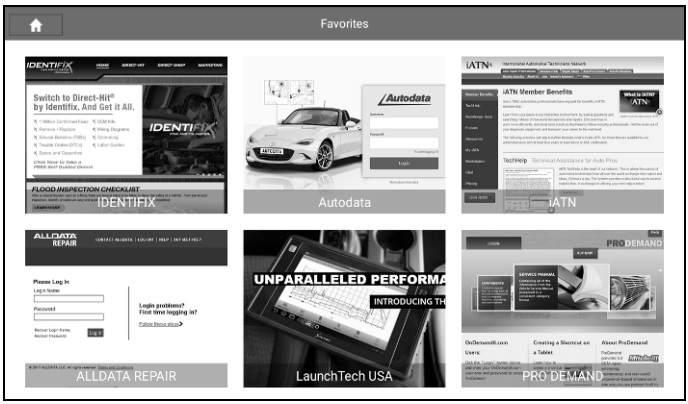


Fig. 5-42

Tap the desired website to visit it.

To add certain website into favorites, scroll the screen to until it reaches to the bottom, tap “+”, a dialog box similar to the following appears.

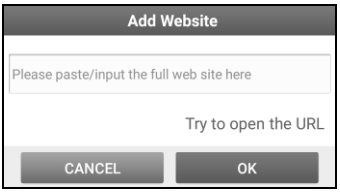


Fig. 5-43

Type in the full web site in the blank, and tap “OK”, it will be listed in the Favorites.

6 Software Update

This module allows you to update the diagnostic software & App, and renew the software subscription.

6.1 Update Diagnostic Software & APP

If you did not download the software in process of product registration or a pop-up message prompting you that some new software can be updated, you may use this option to download it or keep it synchronized with the latest version.

Tap “Software Upgrade” to enter the update center.

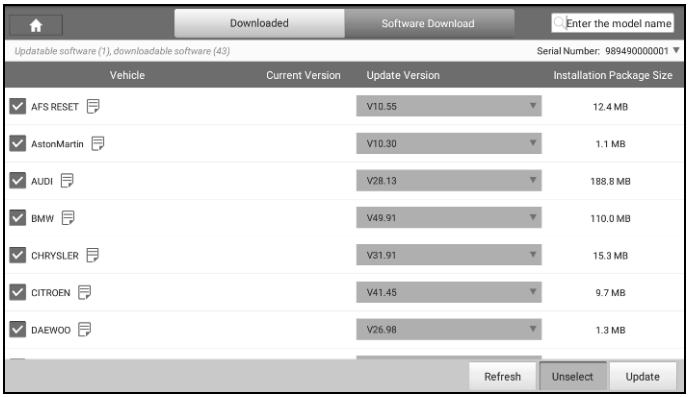


Fig. 6-1

By default, the system enters the “Downloaded” page and all diagnostic software to be updated is selected.

* Note: If some software has not been downloaded yet, tap “Software Download” to download it.

- To deselect certain software, tap “Unselect”, and then check the box next to vehicle model.
- To refresh the downloaded list, tap “Refresh”.
- Tap “Update” to start downloading. It may take several minutes to finish it,

please be patient to wait.

- To pause downloading, tap “Stop”. To resume it, tap “Continue”. If network connection failure occurs, tap “Retry” to try again.

Once download is finished, the software packages will be installed automatically.

6.2 Renew software subscription

If the software subscription is due or expires, the system will prompt you to renew your subscription and a “Renewal” button will appear on the bottom of the update page.

There are 2 ways available for you to make payment: PayPal and Subscription Renewal Card (*need to buy it from the local dealer where you purchased the X-431 Throttle).

A. Using PayPal

1. Tap “Renewal” on the update page to navigate to the renewal type selection screen.
2. Select “PayPal”, and then follow the on-screen instructions to finish the transaction.
3. After payment, go to update center to update the diagnostic software.

B. Using Subscription Renewal Card

1. Tap “Renewal” to navigate to the renewal type selection screen.
2. Select “Subscription Renewal Card”.
3. Input the 24-digit pin code of Subscription Renewal Card and then tap “Submit” to finish the renewal.
4. Go to update center to update the diagnostic software.

7 Profile

Use this option to configure/revise personal information.

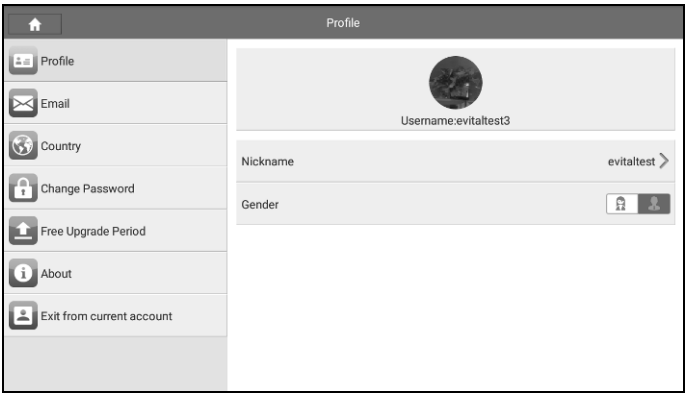


Fig. 7-1

7.1 Profile

This option is used to create your personal profile.

7.2 Email

This option allows you modify your Email address.

7.3 Change Password

This option allows you change your login password.

7.4 Free Upgrade Period

This option lets you check the free update period of the diagnostic software.

7.5 About

Use this item to check the version of the App and disclaimer page.

7.6 Exit from current account

To logout the current user ID, tap “Exit from current account”.

To login the system again, tap “Login”.

8 Settings

This function allows users to manage personal information and VCI connector.

8.1 General

It enables you to make some application settings and view software version information etc.

8.1.1 Units of Measurement

It is designed to set the measurement unit. Metric System and English System are available.

81.2 Expiration Reminder

All pre-installed diagnostic software is free to use for 30 days. Once it expires, it will be locked automatically and the system will prompt you to activate your dongle if the expiration reminder is ON.

8.1.3 Identifix Settings

This option is used to set whether the free 30-day trial Identifix shows or not.

8.1.4 Auto Update

This option is used to set whether automatic update function is ON.

8.2 VCI

This option allows you to manage all activated VCI devices.

If several VCI devices are activated on this tool, a list of VCI devices will be displayed on the screen. If your tool extends to support heavy-duty trucks, you need to switch to the corresponding VCI module before diagnosing it.

Once you choose the device that belongs to other account, you have to log out, and then input the right account to continue.

8.3 VCI Management

If you use the current account to test a vehicle with another X-431 Throttle, please use this item to unpair the VCI device with the previously paired X-431 Throttle.

* Note: please be sure to keep the VCI device powered on while performing the operation.

8.4 Activate VCI

This item lets you to activate a new VCI device.

Fig. 8-1

Input the Serial Number and Activation Code (can be found from the included Password Envelope), and then tap “Activate” to activate it.

8.5 Firmware Fix

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

8.6 Icon Size

This feature allows you to set the size of the diagnostic software icon according to your preference.

Drag the slider to different size and the system will display the corresponding effect.

8.7 Color Theme

This item enables you to set the color theme of the App.

Once you changed it, you have to reboot the system for the change to take effect.

8.8 Printer Set

This option is used to establish a wireless connection between X-431 Throttle and the printer (sold separately) while performing printing operations.

The App is compatible with the “Wi-Fi Printer” (sold separately) and “System” (external printer).

Follow the steps below to connect the Wi-Fi printer.

1. Tap “Printer Set”.

Below describes how to configure the Wi-Fi Printer.

A. If it is the first time you have operated this printer, please proceed the following:

2. For initial use, you are suggested to reset the printer: Press and hold [MODE] & [FEED] for 8 seconds, the following resetting command will be printed out:

   at + default = 1

   ok

   at + reboot = 1

   rebooting...

3. Tap “Reset” to configure Wi-Fi printer.

   Step 1: Connect the printer:

   Tap “Scan” to select the desired printer hotspot named with X-431PRINTER-XXXX (XXXX stands for 4 characters), and then tap “Connect” to enter Step 2.

   Step 2: Join the printer into LAN:

   Tap “Scan” to select the desired local Wi-Fi network from the list, and type in the security password (If it is an open network, password is not required), and then tap “Confirm”.

4. Once the Wi-Fi network of the printer is connected and the printer is found, tap “Test Print” to test the printing.

   Now you can use the Wi-Fi printer to print!

   If the printer is not found, please reset the printer to default factory settings (refer to Step 2 for details) and check whether the current device and the printer are on the same LAN.

B. If you have configured the Wi-Fi printer to the LAN:

2. Tap “Connect to Printer”:

   a). If the local network remains as it is, tap “Test Print” directly to test the printing.

b). If the local network changes, you have to reboot and reconfigure the Wi-Fi printer.

8.9 Print Information

This option lets you define your print information. It mainly includes Workshop, Address, Zip Code, Telephone, Email etc.

Fig. 8-2

After inputting, tap “Save”.

Once you saved the print information, it will be entered automatically in the “More Information” box every time you save the diagnostic report.

8.10 Data Stream Sample

This feature allows you to manage the recorded data stream sample files.

8.11 Vehicle Voltage

This item is used to detect the voltage of the currently tested vehicle when the VCI is plugged into the vehicle’s DLC.

8.12 Diagnostic Software Clear

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

Tap “Diagnostic Software Clear” to enter.

Under the “Hide Software” tab, select the desired diagnostic software and tap “Hide”, it will become invisible. Tap “Unhide” to undo the hide operation.

Under the “Remove Software” tab, select the desired diagnostic software and tap “Delete”, it will disappear from the screen.

8.13 Backup/Restore

This option lets you backup/restore the important data to/from external USB device.

A. Backup

1). Insert the U disk into the Data Transmission Port of the handset.

2). Tap “Backup” to select the data folder to be backed up.

3). Tap “Backup” on the bottom of the screen to copy it to the U disk.

4). Unplug the U disk from the handset.

B. Restore

1). Insert the U disk into the Data Transmission Port of the handset.

2). Tap “Restore” to select the data folder to be restored.

3). Tap “Restore” on the bottom of the screen to copy it to the handset.

4). Unplug the U disk from the handset.

9 Sensorbox (Toolbox)

9.1 Product Summary

X-431 Throttle provides an optional function of automotive sensor simulation test. “Sensor” function is specially designed to diagnose and simulate vehicle sensor faults quickly and conveniently, including “DC voltage simulation”, “Fixed frequency simulation”, “Predefined waveform simulation” and “Hand-painted waveform simulation”.

Vehicle sensors are the signal input devices for electrical control systems, which can transform all kinds of running parameters, such as vehicle speed, coolant temperature, engine RPM, air flow, throttle opening, etc., into the electronic signal for the vehicle computer who can optimize the engine running status per the above-mentioned parameters to keep the engine working in a prime status.

Meanwhile, it integrates the functions of automobile multimeter (For detailed operations on multimeter, please refer to Chapter 10), which enables users to perform voltage, resistance and frequency test. (The function utilizes the same hardware device as the sensor module)

It features automotive sensor simulation test and multimeter test function.

Sensorbox

Parameters	Scope
Precision	±5%
Voltage range	-5V~+5V
Max output current	70mA
Predefined frequency range	0~150Hz
Square-wave signal pulse frequency	0~15KHz
Square-wave signal duty ratio	10%~90%

Multimeter

Parameters	Scope

Precision		±5%
Voltage test	Testing range	DC-400V~+400V
	Input impedance	10Mohm
Resistance test	Testing range	0~40Mohm
Frequency test	Testing range	0~25KHz
	Input impedance	1000Gohm
	Input voltage	1~12V

9.2 Structure & Accessories

9.2.1 Sensorbox structure

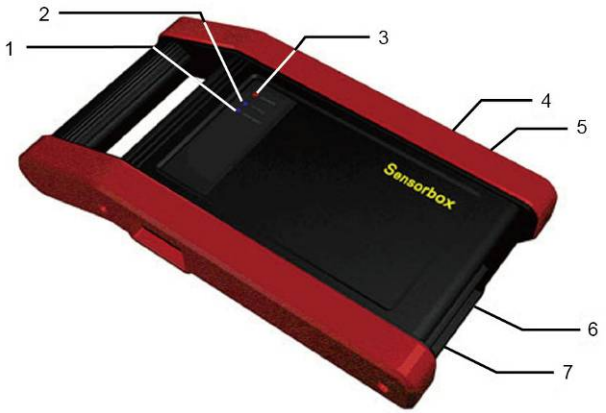


Fig. 9-1 Structural diagram of Sensorbox

Table 9-1 shows the ports and indicators for X-431 Throttle sensorbox

No.	Name	Description
1	Data receiving indicator	Indicator (green) for receiving data from main unit.
2	Data sending indicator	Indicator (green) for sending data to main

		unit.
3	Power indicator	It keeps steady on (red) after the sensorbox is powered on.
4	Type-B USB port	Connect to main unit with USB cable when it is applied as separated USB device.
5	Power connector	Connect to power supply through the power adaptor.
6	COM	Common terminal of multimeter
7	VΩHz	Testing terminal of multimeter

9.2.2 Sensorbox accessories

The sensorbox accessories include sensor test cable, probe etc. See Table 9-2.

As the product configuration can be different, the accessories included with the product may differ from the accessories listed on this manual. Please see the packing list attached to the product for the detailed accessories.

Table 9-2 Accessory checklist

No.	Name	Picture
1	Sensor test cable	
2	Sensor probe	
3	Multimeter probe	
4	Electronic control converting cable 1	
5	Electronic control converting cable 2	
6	Electronic control converting cable 3	
7	Electronic control converting cable 4	

9.3 Sensor Simulation

9.3.1 Connections

1. Firstly, power the X-431 Throttle tablet on.
2. Plug one end of the sensor test cable (black) into the “COM” interface of the sensorbox, and then the other end to the test probe or electronic control converting cable.
3. Connect one end of the sensor test cable (red) into the “VΩHz” interface of the sensorbox, and then the other end to the test probe or electronic control converting cable.

Note: Choose corresponding cables and test probes according to different terminals.

9.3.2 Simulation test

Simulation test enables users to exactly judge if the sensor is good or not to avoid replacing components blindly. For example, the trouble code indicates the fault is in water temperature sensor itself. But we need to confirm whether the fault results from water temperature sensor or the connections between ECU and sensors, or ECU itself. In this case, we can make full use of simulation test to input the signal of simulating water temperature sensor, instead of water temperature sensor, to the microcomputer. If the engine works better and the fault vanishes, the fault is in the water temperature sensor. If the fault still occurs, input the signal to the corresponding terminals of ECU. Consequently, if the fault disappears, the fault lies in the connection between water temperature sensor and ECU, otherwise, the fault exists in ECU.

After all connections are properly made (refer to Chapter 9.3.1 for details), launch X-431 Throttle application and enter the Job menu interface, then tap “Toolbox” -> “Sensor” to enter the test selection screen. See Fig. 9-2.

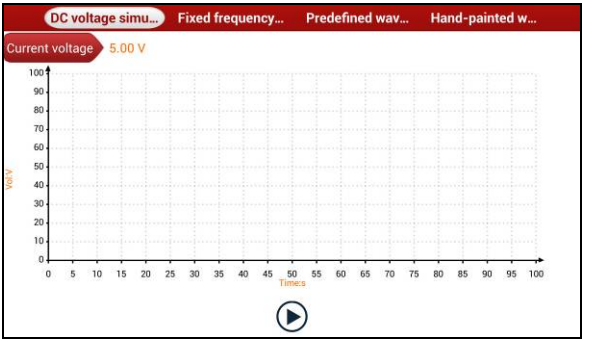


Fig. 9-2

1. DC voltage simulation

In Fig. 9-2, tap [Current voltage], then tap “+” or “-” to adjust the output voltage value. Alternatively, user can also tap edit box, then use the on-screen keyboard to input the desired value directly. After selecting or inputting the desired voltage based on the working characteristics of sensor, tap the ▶ button, then the X-431 Throttle will begin to output the simulation voltages. Please note the red probe is the output terminal of simulation voltage.

2. Fixed frequency simulation

This option enables you to simulate the square wave signal of pulse frequency of 0.1 ~ 15 kHz, amplitude range of -5V ~ +5V and duty cycle 10% ~ 90%.

In Fig. 9-2, tap “Fixed frequency simulation” to enter a screen similar to Fig. 9-3.

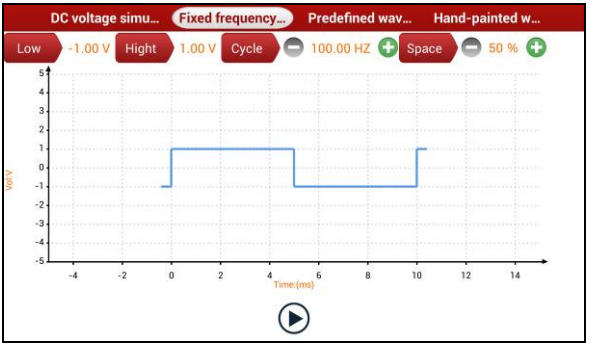


Fig. 9-3

Tap the setting option tab, then tap “+” or “-” to adjust the output. After setting, tap ▶ to perform the test.

3. Predefined waveform simulation

X-431 Throttle provides some common sensor waveforms which have been predefined to facilitate users to simulate sensor signals. As long as you call out the predefined waveform, then tap ▶ to start simulating output of corresponding sensor waveform and no more parameter settings of simulation waveform are required.

In Fig. 9-3, tap “Predefined waveform simulation” to enter the screen shown as Fig. 9-4.

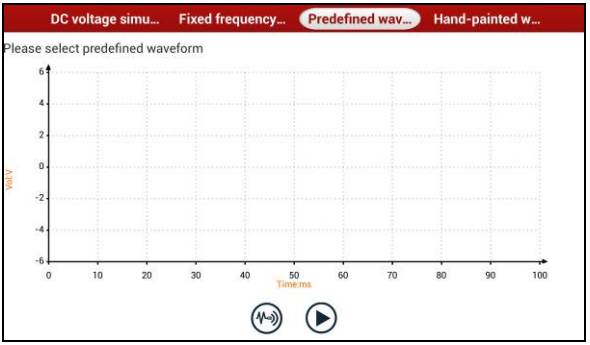


Fig. 9-4

Here, tap button, a screen similar to Fig. 9-5 will appear.

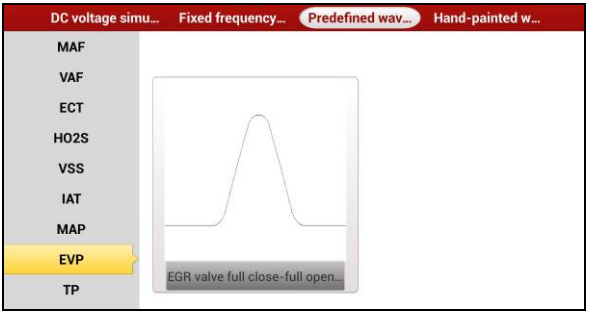


Fig. 9-5

In Fig. 9-5, the left setting column stands for sensor types and the right area

displays waveform. The sensor types are explained as below:

ECT: Coolant Temperature Sensor

EVP: EGR Valve Position Sensor

HO2S: Heated Oxygen Sensor

IAT: Intake Air Temperature Sensor

MAF: Mass Air Flow Sensor

MAP: Manifold Absolute Pressure Sensor

TP: Throttle Position Sensor

VAF: Volume Air Flow Sensor

VSS: Vehicle Speed Sensor

For example, tap “ECT” – “Warm (NTC Thermistor)” in Fig. 9-5, the right screen will display the waveform of the sensor.

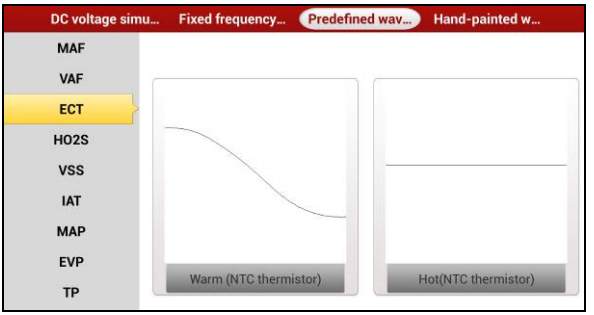


Fig. 9-6

In Fig. 9-6, tap the waveform, then the pre-defined waveform has been set.

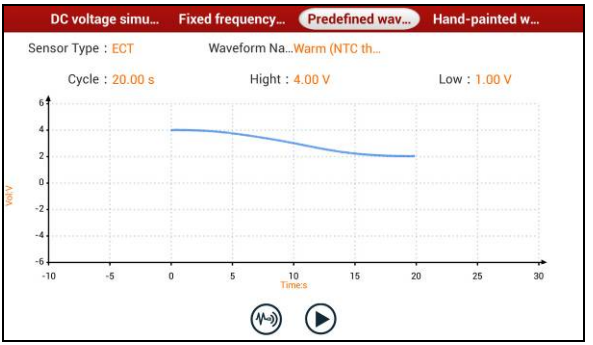


Fig. 9-7

In Fig. 9-7, tap ▶ button to perform simulation test.

4. Hand-painted waveform simulation

This option offers great convenience for users to simulate special waveform or fault wave. Users only draw the shape of waveform which needs to be simulated in central drawing area, and then configure some parameters on the top, namely high level, low level, and cycle of waveform, then tap ▶, X-431 Throttle will output a waveform as desired.

Warning: Just draw a complete periodic waveform (when it is output, the system will regard the waveform in the drawing area as a periodic one). Users should draw as large as wave in drawing zone so that the system can sample more points to reduce tolerance.

In Fig. 9-2, tap "Hand-painted waveform simulation", a screen similar to Fig. 9-8 will appear.

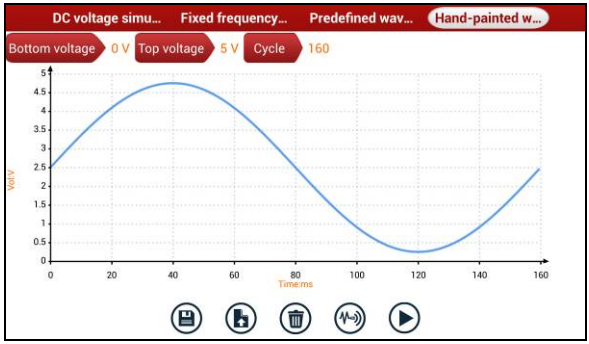


Fig. 9-8

Button descriptions:

[💾]: Save the current waveform.

[📂]: Loads the previously saved hand-drawn waveform.

[🗑]: Clear all hand-drawn waveform.

[〰]: Click to call out the predefined waveform for reference.

[▶]: Continues the following operation.

9.3.3 Precautions on checking vehicle sensor

- Hold the connector when plugging or unplugging it. Do not pull the cable for

unplugging.

- At first check the fuse, fusible line and terminals. Then check others after eliminating these faults.
- When measuring voltage, the ignition switch should be on and the battery voltage should not be less than 11V.
- When measuring voltage, please shake the lead lightly in the vertical and horizontal direction for more precision.
- When checking whether there is open in the line, disconnect the CEU and the relevant sensor at first, then measure the resistance among the ports of sensor in order to determine whether open-circuit / contact fault exists or not.
- When checking if there is a short in the line, please disconnect the CEU and the relevant sensor, then measure the resistance value of the ports between the connected port and the vehicle body. If the resistance value is more than 1MΩ, no fault occurs.
- Before disassembling the engine electrical control system cable, cut off the power supply, that is, turn the ignition switch OFF and disconnect the cables on the battery poles.
- Contact the test probe and the two terminals/ the two leads to be measured when measuring the voltage between the two terminals or the two leads.
- Contact the red test probe to the terminal/ the cable to be measured, and the black probe to the ground when measuring voltage of one terminal/ one cable.
- When checking the continuity of the terminals, contacts and leads, the method for measuring their resistances can be used.
- Check the faults in the terminals of the CEU to sensors, relays, etc.
- There are two test probes in the testing wire. The black one is the common signal terminal (signal GND); the red one is the input terminal for voltage, resistance, and frequency test and output terminal for simulation voltage, simulation frequency and oxygen sensor. Please choose the correct probes to match the different terminals.

10 Multimeter (Toolbox)

10.1 Main Menu

Make sure the X-431 Throttle handset and the sensorbox are properly connected (Refer to Chapter 9.3.1 Connections for details), launch X-431 Throttle application, tap “Toolbox” -> “Multimeter” to display the test menu.

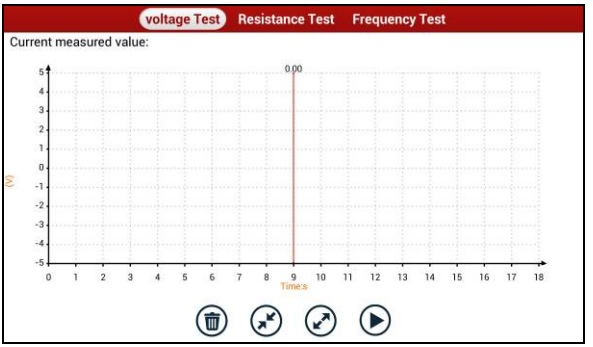


Fig. 10-1

Tap the desired test to perform related test.

The operation method on **Resistance Test** and **Frequency Test** is identical to that of **Voltage Test**. Here take Voltage test as an example for demonstration.

Tap “Voltage Test”, a screen similar to Fig. 10-2 appears:

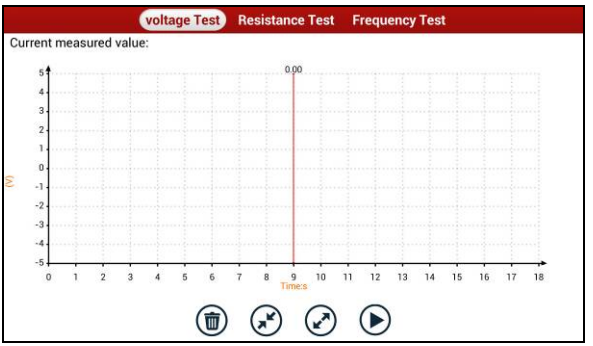


Fig. 10-2

The following operations can be done:

[🗑]: Erases the currently displayed waveform and display it starting from the left.

[⤡]: Reduces the range and zoom in the waveform.

[⤢]: Increase the range and zoom out the waveform.

[▶]: Starts or stops the testing process.

10.2 Test Sample

Knock sensor testing

(1) Resistance test for knock sensor

Switch ignition “OFF”, unplug the wire connector of knock sensor, test the resistance between the wire terminal and the case of knock sensor with “Resistance test” function, it shall be ∞ (disconnected), and if it is 0Ω(conductive), which means the knock sensor shall be replaced. For the magnetostriction knock sensor, it can also test the resistance by the “Resistance measurement” function; the resistance shall be compliant with the specified value (see specific service manual for the detailed data), otherwise, the knock sensor shall be replaced.

(2) Checking for the output signal of knock sensor

Unplug the wire connector of knock sensor, check voltage between knock sensor connector terminal and ground wire of knock, it should be output pulse voltage; otherwise, the knock sensor shall be replaced.

Coolant temperature sensor testing

(1) Resistance test for coolant temperature sensor

On vehicle testing:

Switch ignition “OFF” and unplug the wire connector of coolant temperature sensor, then use the “Resistance measurement” to test the Resistance between two terminals of sensor. The relationship between the resistance and the temperature is in inversely proportion (negative temperature coefficient), which shall be less than 1kΩ during warming up.

Independent testing:

Unplug the wire connector of coolant temperature sensor, then remove the sensor from the engine; place the sensor into a breaker with water and heat the water, then use the “Resistance measurement” to test the Resistance between two terminals of coolant temperature sensor at different water temperature. Compared the measured value with the standard value, if the Resistance is not

compliant with the standard, then the coolant temperature sensor shall be replaced.

(2) Output signal voltage testing for coolant temperature sensor

After installing the coolant temperature sensor, plug the wire connector of sensor, and then switch ignition ON, test the output signal voltage between the two terminals of wire connector. The tested voltage shall be in inverse proportional with the coolant temperature. When the harness of coolant temperature sensor is disconnected, the voltage shall be about 5V if the ignition switch is ON.

11 Batterybox (Toolbox)

11.1 Product Summary

X-431 Throttle provides an optional function of automotive battery test, which adopts the latest state-of-the-art conductance testing technology in the world and can test vehicle's battery status. Two testing environments (Inside the Vehicle and Outside the Vehicle) are available and applicable to battery test. In addition to battery test, charging system and actuation system test can be done while Inside the Vehicle is selected.

It supports various battery standards and specifications, including CCA, DIN, IEC, EN, JIS, SAE and GB etc. It is specifically designed to help car owner, repair workshop, battery factory use battery test instrument properly and determine whether the battery is normal or not.

Battery test aims to check starting plumbic acid storage batteries for vehicles, ship, boats and aviations, etc. It can test all kinds of batteries complying with CCA, DIN, JIS, EN, GB and SA standards. For detailed test standards, please refer to Table 11-1.

Table 11-1 Test standard

Standards	Standard (Full name)	Test capacity range
CCA	Battery Council International	100～1700
DIN	Deutsche Industry Normen	100～1200
JIS	Japanese Industry Standard	26A17～245H52
EN	Europe Norm	100～1700
IEC	National Electrical Commission	100～1200
GB	Chinese National Standard	100～1200
SAE	Society of Automotive Engineers	100～1700

11.2 Test Environment

11.2.1 Test environment

Inside the vehicle test indicates that the battery connects to loading devices, such as engine, etc. After doing battery test, it can perform charging system and actuation system test, which is proceeded as a whole simultaneously. Charging system and actuation system test is not required but must not be performed before battery test. Because it is difficult for vehicle technicians to judge where is faulty exactly if they have the faintest idea of battery's status itself.

Outside the vehicle test indicates that the battery is disconnected from all loading devices on vehicles. Therefore, only battery test is supported in this condition.

11.2.2 Battery status and description

There are mainly 5 states as follows:

No.	States	Descriptions
1	Good battery	Indicates battery is normal.
2	Replace battery	Indicates that battery is aged or becomes rejected, or battery life cycle approaches to be exhausted. In this case, battery voltage appears to be normal, but battery itself is not well, i.e. battery polarity board has been completely vulcanized or aged. Please replace battery immediately.
3	Good-recharge	Stands for low battery. The battery is good itself.
4	Charge-retest	It is better for a few batteries to be fully charged before testing in order to avoid judging in error under special conditions.
5	Bad cell	Indicates one of the battery cells is bad and cannot work normally, but for which one is bad, it can't be verified. In this case, battery voltage is generally lower than 11V, mainly resulting from internal circuitry damage, such as short circuit, open circuit, dummy weld etc.

11.3 Batterybox Structure & Accessories

11.3.1 Batterybox structure

Fig.11-1 Batterybox structure diagram

1. Battery connector: Connect to vehicle's battery for battery test.
2. B type USB terminal: Connect to the X-431 Throttle tablet with USB cable.

11.3.2 Test accessories

Fig. 11-2 Kelvin clip

Fig. 11-3 A/B cable

11.4. Connections & Operations

11.4.1 Connection

Connect one end of the A/B cable to the B type USB terminal of the batterybox, and then connect the other end to the USB port of X-431 Throttle tablet. This connection applies to outside the vehicle test and inside the vehicle.

Notes:

1. Wait about 10 seconds and begin to communicate since the batterybox needs to initialize after connection is complete, otherwise, communication may fail.

2. Red lamp on the batterybox means it has been successfully powered up; If the green light is always on, it indicates the clip is well connected; while the green light blinks, it indicates that the clip has poor contact. Do not perform any test until the clip and A/B cable are properly connected.

11.4.2 Inside the vehicle test

Battery test and charging system & actuation system test can be done in this mode.

1. Battery test

Enter battery test main menu, and select a desired test environment as shown in Fig. 11-4.

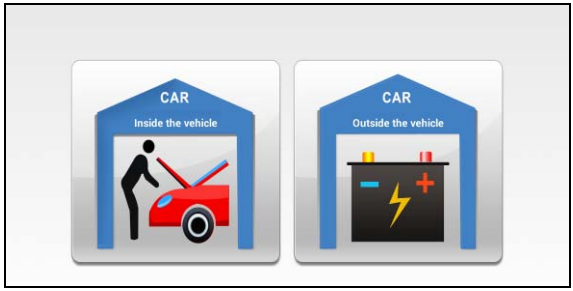


Fig. 11-4

Notes: The sequences of inside the vehicle and outside the vehicle test are almost the same, but under inside the vehicle condition, all loads in vehicles must be powered off for getting an exact test value.

1. Firstly, the system detects whether floating electricity exists or not before testing. If yes, turn on the headlamp to remove it. Otherwise, the system starts test program directly.
2. Tap [Inside the vehicle], the system starts detecting floating electricity automatically. If floating electricity is detected, it will prompt you to turn on the headlamp.
3. Follow the on-screen instructions to turn on headlamp, the system starts removing floating electricity.
4. Once the floating electricity is removed, a prompt message box “The floating electricity has been removed, please turn off the headlamp to continue the testing” will appear on the screen.
5. Follow the on-screen instructions to turn off the headlamp and tap [OK], the

system will continue the testing. Tap ⊖, it will enter testing standard selection screen.

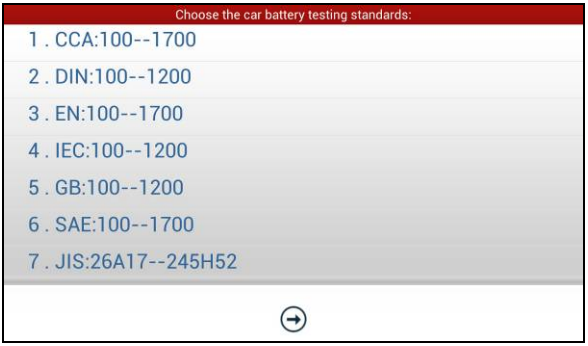


Fig. 11-5

6. Select a testing standard except for JIS and tap ⊖, a screen similar to Fig. 11-6 will appear. Users can adjust capacity size by tapping on < or > or by dragging the slider on the bar.

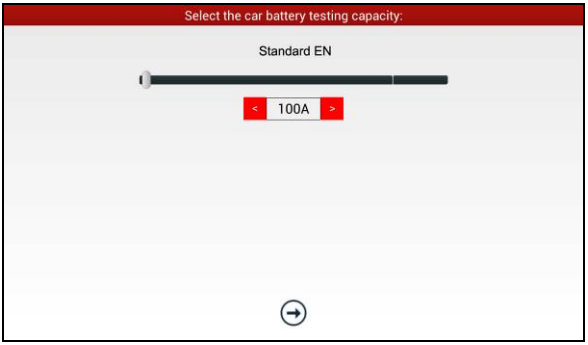


Fig. 11-6

If JIS is selected, tap ⊖, the system will enter Select testing capacity screen. Users can select corresponding standard capacity value according to battery model marked on battery.

7. Tap ⊖ and the testing result will appear on the screen.

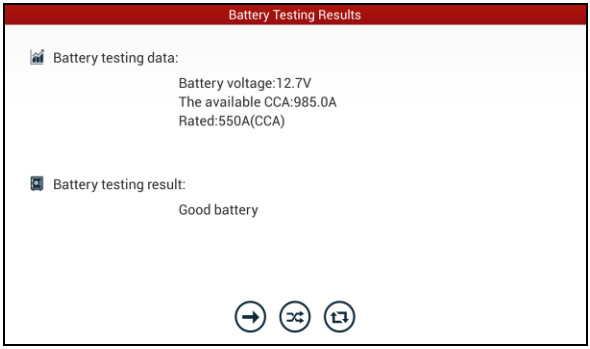


Fig. 11-7

[]: Tap it to perform the charging system and starting system test.

[]: Tap to test it again.

[]: Tap it to reset the test.

2. Charging system and starting system test

While performing this test, the battery's charging voltage value and starting voltage can be obtained in case of engine starting and accelerating. Based on the data, the system will judge whether battery's charging and actuation status is normal or not.

Tap in Fig. 11-7, a dialog box will pop up as Fig. 11-8.

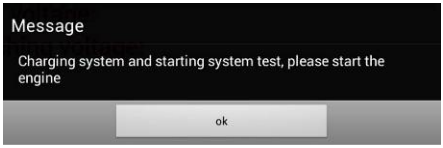


Fig. 11-8

After detecting engine starting, follow the instructions on the screen to increase the speed.

The system begins to receive test data information after acceleration was detected, as shown in Fig. 11-9.

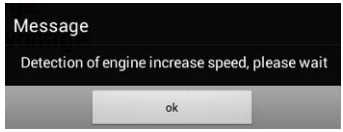


Fig. 11-9

Tap [OK], test data will be shown on the screen.

Notes: It is unnecessary to perform charging system and start system test after finishing battery test, but battery test must be done before undergoing charging system and starting system test.

11.4.3 Outside the vehicle test

It only applies to battery test and detecting floating electricity will be ignored while performing battery test.

On Fig. 11-4, tap [Outside the vehicle] to select battery test standard.

The following operation steps are identical to Steps 6~7 in Chapter 11.4.2 Battery test. Please refer to it for details.

11.5 Precautions On Battery Test

For the purpose of getting accurate test results, unless otherwise special required, all loads need to be power off such as headlamp, engine etc. before testing battery.

The operating time required for charging system and actuation system test varies from person to person. If the engine does not start or accelerate within 30 seconds, the system will prompt you “receiving timeout” and return to the initial status.

Whether Engine is off or not has no influence on charging and actuation test result after increased speed is detected, but other loads need to be powered off.

The accuracy of battery voltage, charging voltage, start voltage is 0.01V in test results; CCA (Cold Cranking Amps) precision is 5CCA.

Generally, charging voltage value is greater than starting voltage.

Charging voltage range is as follows: 13.8--14.5V for domestic vehicle; 13.3--15.5V for imported vehicles. The voltage varies with different car models, so you have to judge based on related vehicle models. In general, the DC voltage is stable, but it also varies with different revolution speed.

Starting voltage range: The value higher than 9.6V is regular, otherwise it is too low. Due to different situations, whether the starting voltage is higher or not does

not mean the vehicles or batteries are faulty. For detailed faults, other special equipments are needed. To validate the accuracy of the value, the best method is to collect the signals of starting and charging voltage and observe it on an oscillometer.

Generally, the voltage is lower than 11V for the bad cell battery, but it is possible that the battery is completely exhausted or has a serious low capacity. In this case, just recharge your battery. Bad cell always happens when the loads on a stopping vehicle are turned on for a long time.

Please note that it is normal for quick detecting of “Increase speed” because it follows the theory of detecting “Increase speed”: If the detected voltage is higher than the previous battery test voltage, the system will prompt you a message of “Engine has been speeded”

It has no influence on test result in the event that engine’s output voltage or engine revolution is not very stable. No matter whether the vehicle is accelerated or not, the output voltage only differs within 0.2V.

While doing inside the vehicle test, Kelvin clip is always found to be in poor contact. To remain it in good contact, please shake it several times before testing. Take down the battery connector, and test it again, the value probably varies. The deviation may arise from battery connector.

Pay more attention to connect the clip. The battery poles connect with conductor, which makes the clip has a poor connection when testing battery. A tolerance of dozens of CCA occurs if the clip is out of position, or oil, dust attaches on the pole. The gear and main body of clip should be fully matched with battery poles.

Notes:

1. Battery poles inside the vehicle are enveloped by connectors, which may produce some errors for test results. The tolerance results from the resistance of connectors. The greater the resistance value is, the greater the tolerance becomes. But generally, the tolerance does not affect the test conclusion.
2. Testing the battery separately generates an exact test result. The battery box is a very useful auxiliary tool for quick test. If any problems were found, test it separately for getting an exact test result.

12 Oscilloscope (Toolbox)

12.1 Introduction

The Scopebox is an optional add-on module of X-431 Throttle, including automotive oscilloscope and automotive ignition waveform.

Automotive oscilloscope can make the auto repair technician quickly judge the faults on automotive electronic equipment and wiring, and the oscilloscope sweep speed is far greater than the signal frequency of such vehicles, usually 5-10 times of the measured signal. The automotive oscilloscope not only can quickly acquire the circuit signal, but also can slowly display the waveform to observe and analyze. It can also record and store the tested signal waveform which can be recalled to observe for the fast signal, having great convenience to failure analysis. Either high-speed signal (e.g.: Injection nozzle, intermittent fault signal) or the slow-speed signal (e.g. the throttle position change and the oxygen sensor signal) can be observed through automotive oscilloscope in an appropriate waveform.

The electronic signal can be compared and judged via measuring five parameters indexes. The five parameters are the amplitude (the maximum voltage of signal), the frequency (the cycle time of signal), the shape (the appearance of signal), the pulse width (the duty cycle or the time range of signal), and the array (the repetition characteristic of signal), which can be tested, displayed, saved by the automotive oscilloscope. Via the waveform analysis can further detect the circuit fault on sensors, actuators, circuits, and electronic control units, etc.

12.2 Structure & Accessories

12.2.1 Scopebox structure

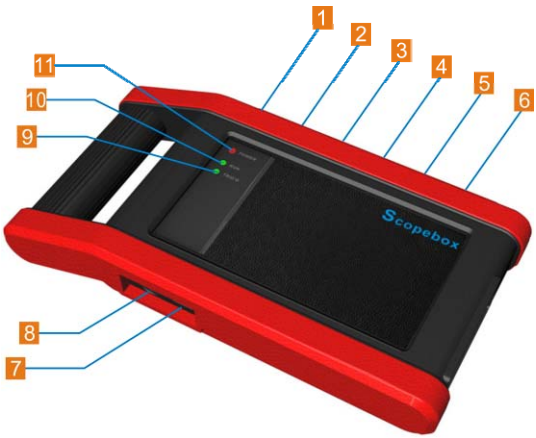


Fig 12-1 Scopebox Structure Diagram

Table 12-1 shows the ports and indicators for the Scopebox.

No.	Name	Description
1	Fixed signal generator	Generate a square signal with fixed 1K frequency.
2	CH1	Channel 1
3	CH2	Channel 2
4	CH3	Channel 3
5	CH4	Channel 4
6	External trigger	External trigger signal
7	B-shaped USB interface	Connect main unit via USB cable as separated individual USB devices.
8	Power interface	Connect to power supply via the power adapter.
9	Communication indicator	It blinks in process of data communication.

10	Running indicator	It remains steady green after the Scopebox is running.
11	Power indicator	It keeps steady red after the Scopebox is powered on.

12.2.2 Scopebox accessories

The Scopebox includes the secondary pickup cable for 4-channel oscilloscope, crocodile clips for 4-channel oscilloscope, etc. See Table 12-2.

As the product configuration can be different, the accessories included with the product may differ from the accessories listed on this manual. Please see the packing list attached to the product for the detailed accessories.

Table 12-2 Accessory checklist

No.	Name	Picture
1	Secondary ignition pickup for 4-channel oscilloscope	
2	Crocodile clips for 4-channel oscilloscope	
3	Direct ignition extension cable	
4	6-way universal guide line for 4-channel oscilloscope	
5	BNC to 4mm connector test cable	

6	Pin connector suite for 4-channel oscilloscope	

12.3 Connection & Initial Use

12.3.1 Connection

The Scopebox should work with the X-431 Throttle tablet.

1. Firstly, power on the X-431 Throttle tablet.
2. Then plug one end of ground cable of the Scopebox into external trigger channel (GND), and the other end should be grounded.
3. Connect one end of probe cable to the CH1, CH2, CH3, or CH4 on the Scopebox, and the other end to related signal terminal.

Warning: Please use the specific capacitance probe when diagnosing the ignition high voltage line. Never connect the Scopebox to the ignition secondary circuit directly.

12.3.2 Initial interface introduction

Fig. 12-2 displays the initial interface of the Scopebox.

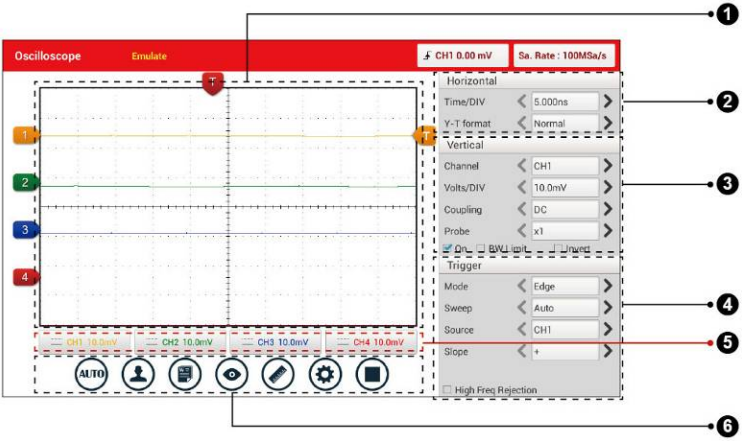


Fig. 12-2

No.	Descriptions

1	Signal display area
2	Horizontal Settings: Controls the time base.
3	Vertical Settings: Controls the amplitude of the displayed signal.
4	Trigger Settings: Controls the start event of the sweep.
5	Channel Selection Button
6	Function Menu [Auto]: It indicates auto trigger setting. [Ref]: There are expert reference and base reference available. Expert reference enables you to recall your customized expert database, whereas base reference provides automatic pre-setting function of specialized sensors. [File]: Provides save snapshot, snapshot manager, waveform record and waveform replay. [View]: Calibration and display settings are available. [Measure]: Includes signal source measurement, horizontal measurement, vertical measurement and clear measurement. [Settings]: Shows/hides the parameter settings area including horizontal settings, vertical settings and trigger settings. / [Start/Stop]: Starts/stops collecting waveforms.

12.4 Operations

12.4.1 Channel selection and attributes setting

<1> Channel selection

There are two ways available for channel selection:

A. Select from the channel tab shown at the bottom of the waveform display area

B. Select from Vertical settings

Note: For better comparison and identification, each channel and waveform are marked in different colors.

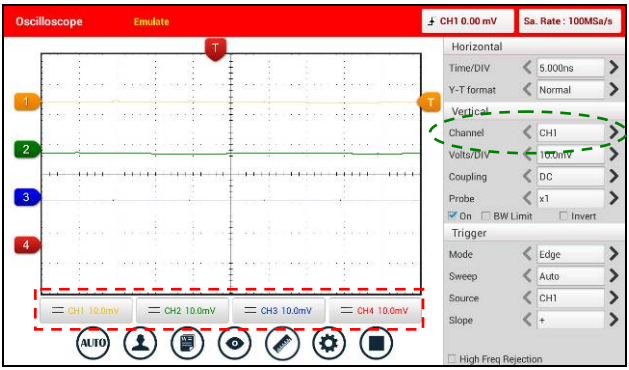


Fig. 12-3

<2> Channel attributes & trigger setting

Channel attributes can be set via horizontal settings and vertical settings.

Horizontal Settings

User can make some settings directly by tapping < or > next to options.

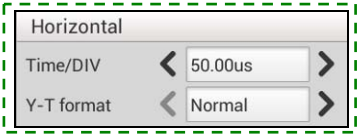


Fig. 12-4

Options descriptions:

Menu	Comments/Settings
Time/DIV	Horizontal scale. If the waveform acquisition is stopped (using the ▶/■ button), the Time/DIV selector expands or compresses the waveform.
Y-T format	The conventional oscilloscope display format. It shows the voltage of a waveform record (on the vertical axis) as it varies over time (on the horizontal axis).

Vertical Settings

The trigger determines when the Scopebox starts to acquire data and display a

waveform. When a trigger is set up properly, it can convert unstable displays or blank screens into meaningful waveforms.

When the Scopebox starts to acquire a waveform, it collects enough data so that it can draw the waveform to the left of the trigger point. The Scopebox continues to acquire data while waiting for the trigger condition to occur. After it detects a trigger, the Scopebox continues to acquire enough data so that it can draw the waveform to the right of the trigger point.

User can make some settings directly by tapping < or > next to options.

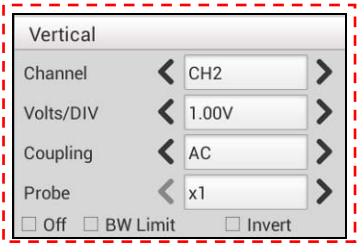


Fig. 12-5

Options descriptions:

Menu	Comments/Settings
Channel	To select the channel source.
Volts/DIV	It is defined as “Volts/Division” and mainly used to change the resolution.
Coupling	Trigger coupling determines what part of the signal passes to the trigger circuit. AC, DC and Ground are included: AC: Blocks the DC component of the input signal. DC: Passes both AC and DC components of the input signal. Ground: Disconnects the input signal.
Probe	When using a probe, the Scopebox allows you to select the attenuation factor for the probe. The attenuation factor changes the vertical scaling of the Scopebox so that the measurement results reflect the actual voltage levels at the probe tip.

BW Limit	ON: Limits the channel bandwidth to 20MHz to reduce display noise. OFF: Get full bandwidth.
Invert	ON: Turn on the invert function. OFF: Restore to the original display of the waveform.

Trigger setting

Trigger indicates that when certain waveform meets the conditions that are predefined according to the requirements, the Scopebox acquires the waveform and its adjacent section, and then presents it on the screen.

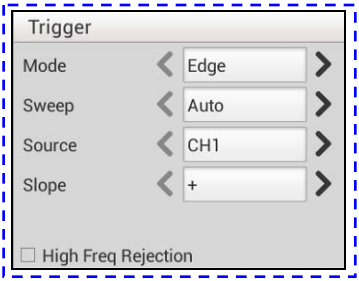


Fig. 12-6

1) If **Edge** trigger is selected (An edge trigger determines whether the Scopebox finds the trigger point on the rising or the falling edge of a signal.):

Menu	Comments/Settings
Sweep	The sweep mode determines how the Scopebox behaves in the absence of a trigger event. The Scopebox provides three trigger modes: Auto, Normal, and Single. Auto: It allows the Scopebox to acquire waveforms even when it does not detect a trigger condition. If no trigger condition occurs while the Scopebox is waiting for a specific period, it will force itself to trigger. When forcing invalid triggers, the Scopebox can not synchronize the waveform, and then waveform seems to roll across the display. If valid triggers occur, the display becomes stable on the screen. Normal: This mode allows the Scopebox to acquire a

	waveform only when it is triggered. If no trigger occurs, the Scopebox keeps waiting, and the previous waveform, if any, will remain on the display. Single: In this mode, it only acquires the waveform that generates for the first time the trigger conditions are met, and then stops after finishing capture.
Source	Select which channel as trigger signal.
Slope	+ : Trigger on rising edge - : Trigger on falling edge
High Freq Rejection	Reject high frequency signals when selected.

2) If **Pulse Width** trigger is selected (Pulse trigger occurs according to the width of pulse. The abnormal signals can be detected through setting up the pulse width condition):

Menu	Comments/Settings
Sweep	The sweep mode determines how the Scopebox behaves in the absence of a trigger event. The Scopebox provides three trigger modes: Auto, Normal, and Single. Auto: It allows the Scopebox to acquire waveforms even when it does not detect a trigger condition. If no trigger condition occurs while the Scopebox is waiting for a specific period, it will force itself to trigger. When forcing invalid triggers, the Scopebox can not synchronize the waveform, and then waveform seems to roll across the display. If valid triggers occur, the display becomes stable on the screen. Normal: This mode allows the Scopebox to acquire a waveform only when it is triggered. If no trigger occurs, the Scopebox keeps waiting, and the previous waveform, if any, will remain on the display. Single: In this mode, it only acquires the waveform that generates for the first time the trigger conditions are met, and then stops after finishing capture.
Source	Select which channel as trigger signal.

Condition	To select pulse condition.
Pulse Width	Set required pulse width.
High Freq Rejection	Reject high frequency signals when selected.

12.4.2 Auto

The Scopebox has an Auto feature that sets up the Scopebox automatically to display the input signal in a best fit.

Tap AUTO, the Scopebox may change the current settings to display the signal. It automatically adjusts the vertical and horizontal scaling, as well as the trigger coupling, position, slope, level and mode settings.

12.4.3 View Settings

<1> Calibration

This option adjusts the Scopebox's internal circuitry to get the best accuracy. Use this function to calibrate the Scopebox's vertical and horizontal systems.

Tap and then tap [Calibration], a dialog box similar to Fig. 12-7 will appear.

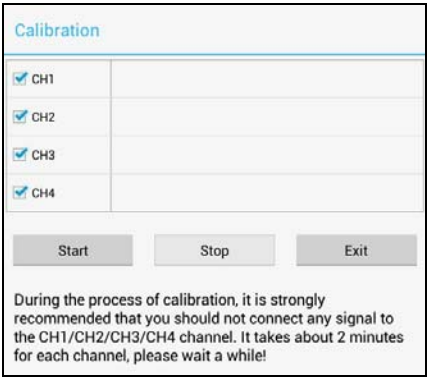


Fig. 12-7

Check the box before the channel to select it. To deselect it, just uncheck it. After choosing the desired channel(s), tap [Start] to start calibration and [Start] button will be temporarily invalid during calibrating. Tap [Stop] to stop calibrating. Once

it becomes active, it indicates calibration has completed.

Note: In process of calibration, make sure CH1/CH2/CH3/CH4 has no signal input. Moreover, calibration may take several minutes and please be patient to wait.

<2> REF settings

Reference waveforms are saved waveforms to be selected for display. The reference function will be available after saving the selected waveform to non-volatile memory.

Tap and then [REF] to enter the REF setting screen.

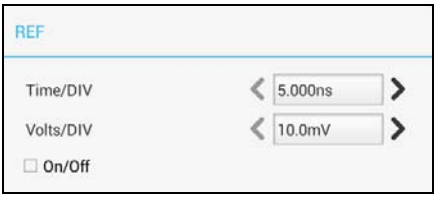


Fig. 12-8

Tap < or > to select the desired reference value for time/DIV and volts/DIV. To show or hide the REF, just check/uncheck the box before On/Off.

<3> Display settings

Tap and then [Display settings] to enter the setting screen.

Fig. 12-9

Select “Vectors” or “Dots” to display waveforms as vectors or dots. Check / uncheck the box before Grid to turn on/off grid display.

12.4.4 Measure

<1> Channel source

Tap and then [Source], a screen similar to Fig. 12-10 will appear.

Fig. 12-10

<2> Horizontal / Vertical measure

Horizontal Measure / Vertical Measure are used to measure voltage parameter and time parameter respectively. Drag A line upwards or downwards to control voltage. Move A line left or right to fine-tune timebase. A line is a solid line and B line is a dotted line.

Tap and then [Horizontal Measure], a screen similar to Fig. 12-11 will appear.

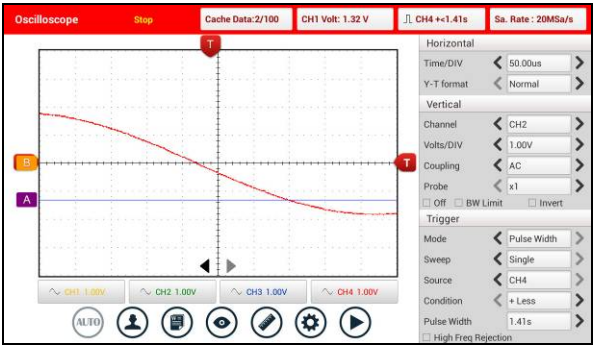


Fig. 12-11

Note: If no desired channel is selected, the system will take the current source as the default channel.

<3> Clear measure

Tap and then [Clear Measure], the system will clear the measurement result on screen.

12.4.5 File management

<1> Save snapshot

While viewing sampling data, tap and then [Save Snapshot] to store the current screen.

<2> Snapshot manager

While viewing sampling data, tap and then [Snapshot Manager] to enter. View, delete and edit operations are supported.

<3> Record waveform

This function is used to record input waveforms that are acquired by the Scopebox at a specific period, and save it as waveform file which can be recalled in future.

It can be performed only when the Scopebox is collecting data in Normal mode.

Tap , then select [Record] from the pop-up menu to start recording.

Fig. 12-12

Tap [Start] to start recording with a minimum record length of 10 frames, and [Stop] to stop recording. While recording, the recorded pages will be shown on the screen.

<4> Load waveform for playback

The Import function enables you to import the stored waveform file for playback and review. During replaying, the Scopebox stops collecting data automatically.

Tap , then select [Waveform replay] from the pop-up menu to enter:

Fig. 12-13

Select the file first, and then tap to open the waveform file. Tap to starting the playback and tap to stop it.

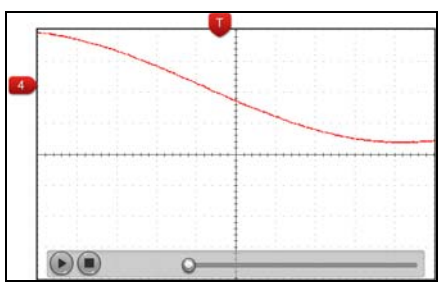


Fig. 12-14

To delete the waveform file, tap .

Tap to return to the previous screen.

12.4.6 Expert reference

<1> Expert Reference

By default, it appears blank. As a matter of fact, Expert reference database is generated by doing the following:

1. Open and edit a snapshot;
2. Select “Joint the expert database” (refer to the following illustration), and then tap to save the waveform being displayed on the screen as REF.

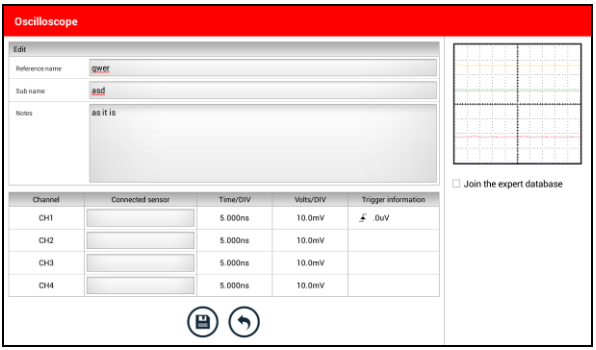


Fig. 12-15

Tap and then [Expert Reference] to enter, the following operation can be done:

: To load and recall the selected file.

: To delete the selected file.

: To edit the selected file.

<2> Base Reference

Preset waveforms of some sensors are available for your reference.

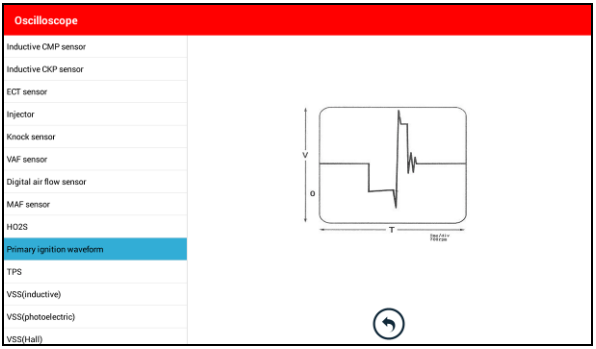


Fig. 12-16

13 Automotive Ignition waveform

The ignition system is the system which has greatest impact on the performances of gasoline engine, as the statistical data shows that nearly half of the failures are caused by poor work of electrical system. And the performance tests of engine often start from the ignition system. Nowadays ignition system includes distributor and distributorless. Distributorless includes independent ignition and simultaneous ignition.

1. Distributor ignition system i.e. contact breaker with contact-controlled ignition system (commonly known as the platinum) and contact breaker with noncontact-controlled ignition system combined with magnet, hall components or infrared.
2. Independent ignition system: crankshaft sensor send out the ignition timing signal and cylinder identification signal so that the ignition system can send out ignition signal to specified cylinder in specified time, each cylinder has its independent ignition coil.
3. Simultaneous ignition system: two cylinders share one ignition coil, when two cylinder pistons reach top dead center at the same time (one is compression, another is the exhaust), two spark plugs will be ignited at the same time, at this time, the ignition for the former cylinder is in high-pressure low temperature gas mixture, the ignition is valid, while for the latter one is in low-pressure high temperature exhaust gas, the ignition is invalid.

X-431 Throttle can test and analyze the secondary signal for various engine ignition systems.

13.1 Secondary-distributor ignition analysis

Connections: Plug the BNC end of secondary ignition pickup into CH1/CH2/CH3/CH4 channel of Scopebox, then connect the high-voltage clip to high-voltage line, and crocodile clips to ground.

Tips: Common ignition sequence (the specific sequence is subject to the actual engine ignition sequence)

Four-stroke in-line four-cylinder: 1-2-4-3, or 1-3-4-2
Four-stroke in-line six-cylinder: 1-5-3-6-2-4, or 1-4-2-6-3-5
Four-stroke in-line eight-cylinder: 1-8-4-3-6-5-7-2
Five-cylinder: 1-2-4-5-3

V 6 engine: generally speaking, based on the person sitting on the driver cab, if

the right side cylinder numbers on the right side, from the front to the back are as follows: 1, 3, 5; and the cylinder numbers on the left side, from the front to the back are as follows: 2, 4, 6; then the ignition sequence is: 1 − 4 − 5 − 2 − 3 − 6. If the cylinder numbers on the right side, from the front to the back are as follows: 2, 4, 6; and cylinder numbers on the left side, from the front to the back are as follows:1, 3, 5; then the ignition sequence is: 1 − 6 − 5 − 4 − 3 − 2.

Figure 13-1 below shows the normal ignition waveform of distributor ignition system, the upper one is the secondary waveform, and the lower one is the primary waveform.

The secondary waveform

A section is contact open period; B section is make contact period, which is the magnetizing field of ignition coil.

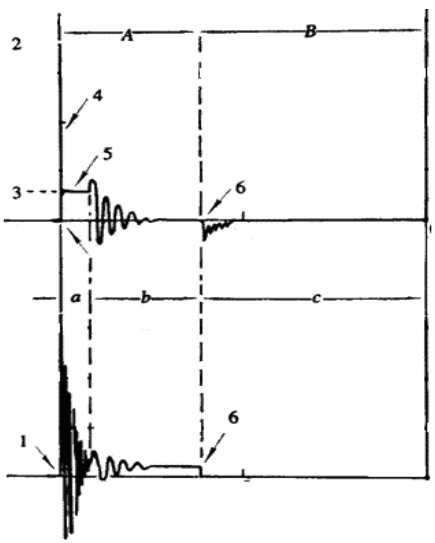


Fig. 13-1

1) Contact break point: the primary circuit of ignition coil cut off, the secondary voltage was sensed and increased sharply
2) Ignition voltage: secondary coil voltage overcome the damper of high voltage line, the contact breaker gap and the spark plug gap to release magnetizing energy, 1-2 section is the breakdown voltage
3) Spark voltage: For the capacitor discharge voltage
4) Ignition voltage pulse: For the charge and discharge sections

5) Spark line: The inductance discharge process, i.e. the mutual inductance voltage of ignition coil maintains the conduction of secondary circuit
6) Contact point close the current flow into primary coil, the primary coil oscillates due to the mutual inductance.

Primary ignition waveform

Section **a** shows the voltage oscillation on the primary circuit due to the magnetic induction of spark in the duration;
Section **b** shows the damped oscillation generated by remaining magnetic field energy after the spark;
Section **c** shows the make contact magneting period of primary coil.

Seen from the waveform, the amplitudes of breaker contact closed angle, break angle and breakdown voltage and spark voltage are very clear, besides, the spark delay period and two oscillations can also be tested. For the ignition system without faults, compared with the whole cycle, the contact closed angle just 45%-50% (four-cylinder), 63%-70% (six-cylinder), or 64%-71% (eight-cyliner); the breakdown voltage is over 15kv; the spark voltage is about 9kV, the spark period is greater than 0.8ms. If these values or waveform are abnormal, it means there is fault or the system needs to be adjusted.

13.2 Secondary-simultaneous ignition analysis

Connections: Plug the BNC end of secondary ignition pickup into CH1/CH2/CH3/CH4 channel of Scopebox, then connect the high-voltage clip to high-voltage line, and crocodile clips to ground.

Connection as shown in figure 13-2:

Fig. 13-2

Fig. 13-3 below shows the valid and invalid ignition waveforms. Under the working status of valid ignition, the breakdown voltage and spark voltage are higher because the cylinder is filled with fresh combustible mixture gas, which has a lower ionization level and vice versa.

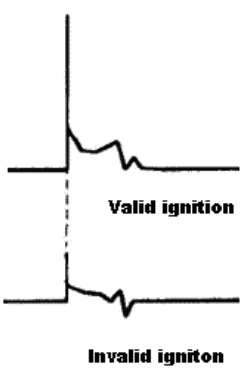


Fig. 13-3

13.3 Secondary-direct ignition analysis

Connection：

1) When the high-voltage wire is exposed, plug the BNC end of secondary ignition pickup into CH1/CH2/CH3/CH4 channel of Scopebox, then connect the high-voltage clip to high-voltage line, and crocodile clips to ground.
2) If no high-voltage wire exposes, dismantle ignition coil of tested cylinder and use direct ignition extension cord. Connect one end to ignition coil which should be grounded via direct ignition grounding wire, and insert the other end into cylinder to joint with spark plug. Then plug the BNC end of secondary ignition pickup into CH1/CH2/CH3/CH4 channel of Scopebox, then connect the high-voltage clip to high-voltage line, and crocodile clips to ground.

Connections are shown in Fig. 13-4:

Fig. 13-4

Fig. 13-5 shows the normal secondary (the upper one) and (the lower one) primary ignition waveform of direct ignition system. Beause the on/off of primary circuit is not opening/closing of mechanical contact, but the conduction of transistor. The primary voltage has no obvious oscillations within the duration, but the voltage increases during the magnetization process due to current limiting, and this change can cause corresponding fluctuations of secondary voltage line as a result of induction of ignition coil.

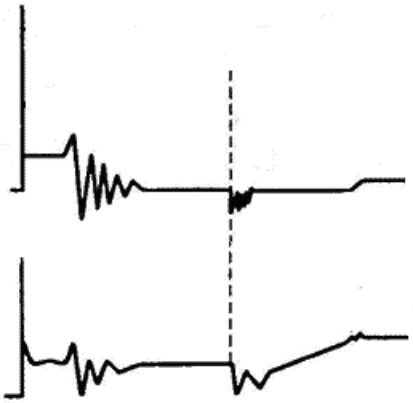


Fig. 13-5

13.4 Waveform analysis mode

The ignition secondary single-cylinder waveform test is mainly used to:

a. Analyze the ignition dwell angle of single cylinder.(ignition coil charging time)

b. Analyze the capability of ignition coil and secondary high tension circuit (from ignition line to ignition voltage line).

c. Find the improper mixture A/F ratio of single cylinder (from combustion line).

d. Analyze the capability of capacitance (platinum or ignition system).

e. Find the spark plug that causes misfire of the cylinder (from combustion line).

This test can provide very meaningful information about the combustion quality for each cylinder. If necessary, this test can also be performed during driving. Since the secondary ignition waveform is significantly affected by different engines, fuel systems and ignition conditions, it is useful for detecting the faults of engine mechanical parts, fuel system components, and ignition system components. Different parts of the waveform can specify that some components and systems on the specific cylinder have faults. Refer to the instructions for various parts of waveform for the related component working status of specific waveform section.

Test methods and conditions:

Start the engine or drive the vehicle according to the driving performance fault or

poor ignition, etc. Confirm the consistence of judgment standard (the amplitude, frequency, shape and pulse width, etc., for each cylinder), check the fault of the waveform for corresponding components.

Waveform results: observe the ignition coil at the beginning of charging, the relative consistent falling edge represents the dwell angle and ignition timing of each cylinder are precise.

Ignition line:
Observe the height consistence of flashover voltage. Too high flashover voltage (even out of the oscilloscope screen) represents a high resistance existed in the ignition secondary circuit (for example, open circuit, or damaged spark plug or high voltage line, or too large time gap on spark plug), while the too short sparking voltage represents the resistance of ignition secondary circuit is lower than normal value (due to pollutant and broken spark plug or the high voltage line of spark plug has electrical leakage, etc.).

Spark or combustion voltage:
Observe the consistence of spark or combustion voltage, as it represents the consistence of spark plug and the air-fuel ratio of each cylinder. In case that the mixing ratio is too lean, the combustion voltage will be lower than normal value.

Combustion line:
Observe the spark or the combustion line which shall be clean with few clutter, as lots of clutter indicates the cylinder has poor ignition due to ignite too early, damaged nozzle, pollutant spark plug, or other reasons. The duration of combustion line indicates the mixing ratio of the cylinder is abnormal lean or rich. Too long combustion line (usually greater than 2ms) represents the mixing ratio is rich, whereas too short of combustion line (usually less than 0.75ms) represents the mixing ratio is lean.

Ignition coil oscillation:
Observe at least two oscillation waveforms after the combustion line, which will be better if more than three oscillation waveforms, as it represents the ignition coil and capacitor (on Platinum or ignition system) are normal.

Primary voltage analysis
According to the faulty primary voltage waveform collected by the ignition analysis, the related components and mechanical equipment status of ignition system electrical circuit can be analyzed, which provides a reliable basis for the adjustment and maintenance of power circuit to avoid the blind demolition.
The waveform shown on Fig. 13-6, appears a lot of clutter on the contact break point, which is obviously caused by the serious erosion on contact break point. It

can be verified via burnishing the contact or changing the circuit breaker.

Fig. 13-6

For the primary voltage waveform shown on Fig. 13-7, the damped attenuation cycles obviously reduced on the spark period, the amplitude became lower, which is evidently caused by capacitor leakage.

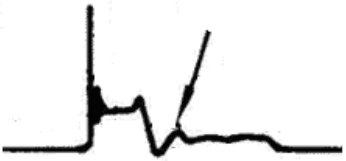


Fig. 13-7

The waveform on Fig. 13-8 shows the accidental pumping during contact closing period. The irregular beating is caused by insufficient spring force.

Fig. 13-8

The curve on Fig. 13-9 shows the contact angle is too small during the magnetizing period, which is caused by too large contact gap.

Fig. 13-9

A lot of clutter will be displayed on the horizontal section of primary waveform if contact has poor grounding, as shown below figure 13-10.

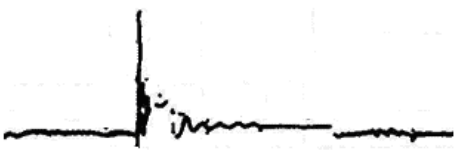


Fig.13-10

Fig. 13-11 shows the fault of low-voltage waveform in electronic ignition system. The voltage does not rise during magnetizing, which indicates that the effect of limitation of the circuit failed and no components on distributorless ignition system can be adjusted. When this waveform is abnormal, you can only replace the ignition coils, igniter, ignition signal generator and cam position sensor, etc., one by one, to find out the faulty component or module.

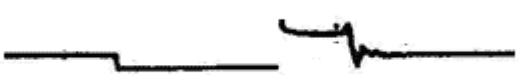
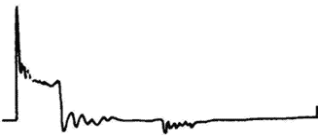


Fig. 13-11

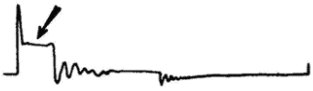
The secondary waveform is also affected by the spark plug, the combustion process, mixture gas composition, the engine thermal state of the ignition coil, etc., which is more complicated. The following lists a large number of measured secondary faulty waveform for reference. Since various factors lead to the

failures, Fig. 13-12 just shows the major possible factors for the failures.

Secondary circuit resistance is too large



Oil or coke was attached in spark plug



Spark plug gap is too large or mixture gas is too lean

Injector of electronic fuel injection poor work

Spark plug overheated or value guide leakage

Mixture ratio is too rich or spark plug leak electricity

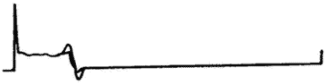
Mixture ration is too lean or cylinder pressure is too low

Distributor cover or distributor lead is matched un-tightly

Spark plug was attached carbon or gap is too small

The primary circuit is reverse

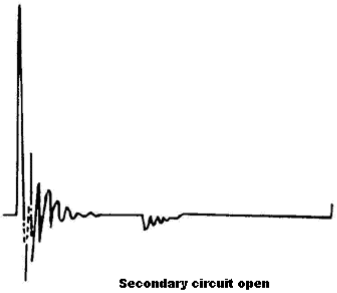
Ignition coil or capacitor leak voltage



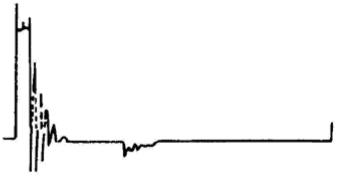
Primary lead of Igniton coil is open

Secondary circuit cut-off intermittently

Secondary coil leakage voltage



Secondary circuit open



Secondary resistance value is too large

Fig 13-12

14 Others

14.1 Email

The function allows you to send and receive email.

14.1.1 Configure an email account

Note: Before sending or receiving email, you have to set up an email account. In addition, this function required a stable network connection.

1. On the home screen, tap **Email**.
2. Choose the desired email account type.
3. Input email address and password, tap “Next”.

Note: If “Manual setup” is selected, please consult your email service provider for detailed parameter setting.

4. Follow the on-screen instructions to proceed until the system prompts you that the account setup has been finished.

14.1.2 Add an email account

1. Tap **Settings** -> **Accounts**.
2. Tap **Add account**.
3. Choose the desired account type.

14.2 Browser

14.2.1 Open browser

On the home screen, tap **Browser** to launch the browser. You can choose the desired homepage or input the website address to browse.

Fig. 14-1

1	Return to the previous page.

2	Advance to the recently visited page.
3	Refresh the current page.
4	Close the current page.
5	Create a new tab.
6	Input a web address.
7	Add the current page as bookmark.
8	Open search bar.
9	Open bookmark list.
10	View more options.

14.2.2 Download files

Files, pictures, and applications can be downloaded from the website in browser.

For example:

Tap and hold a picture, then choose “Save image” from pop-up menu to download it.

To download a link, tap and hold it, and then choose “Save link”.

To protect your X-431 Throttle and personal data, please download applications from trusted sources. To configure it, tap **Settings** -> **Security**, and then slide the Unknown sources switch to off.

14.3 Synchronization

You can transfer media files and APK between the PC and X-431 Throttle.

14.3.1 Connect to PC

1. Use the USB cable to connect the X-431 Throttle to your PC.
2. Swipe from the top, a message “Connected as a media device” appears.

14.3.2 Run on PC

Perform the following steps:

- Locate the new disc.
- Copy the files.

14.3.3 Install an application

Do the following steps:

1. Tap **Settings** -> **Security**, and set the “Unknown sources” to ON, which allows you to install apps from unknown sources.
2. A dialog box appears on the screen, tap “OK” to confirm.
3. Set the tool as “Connected as a media device”, and copy the APK file from the PC to the tool.

14.4 Clear Cache

Doing so clears all browsing records and accounts and enables X-431 Throttle to run smoothly and quickly.

1. Tap **Settings** -> **Apps**.
2. Tap ⋮ and select “Sort by size” to arrange all applications in size order.
3. Tap certain application, then tap “Clear Cache” to release the space these cache files are occupied.

15 FAQ

1. Communication error with vehicle ECU?

Please confirm:

1) Whether the VCI is properly connected.
2) Whether the vehicle ignition switch is ON.
3) If all checks are normal, send vehicle year, make, model and VIN number to us using Diagnostic Feedback feature.

2. Failed to enter into vehicle ECU system?

Please confirm:

1) Whether the vehicle is equipped with the system.
2) Whether the VCI is correctly connected.
3) Whether the vehicle ignition switch is ON.
4) If all checks are normal, send vehicle year, make, model and VIN number to us using Diagnostic Feedback feature.

3. Can I use any other power adaptor other than the included power adaptor to charge the handset?

No. Please use only the included power adaptor to charge the handset. We assume no responsibility for damage or loss resulting from the use of the any other adaptors.

4. How to save power?

- Please turn off the screen while X-431 Throttle keeps idle.
- Set a shorter standby time.
- Decrease the brightness of the screen.
- If WLAN connection is not required, please turn it off.
- Disable GPS function if GPS service is not in use.

5. How to do if the system runs slow?

In this case, please do the followings:

> Check all running applications and stop the unnecessary applications (Steps: Settings -> Apps -> Running -> Tap the desired application and then tap “Stop”).

> Check all installed applications, remove the unnecessary applications (Steps:

Settings -> Apps -> Downloaded -> Tap the desired application and then tap “Uninstall”).

If all steps mentioned above are finished and the system still works slowly. Please try to close the system and reboot your X-431 Throttle.

6. How to reset X-431 Throttle?

⚠ Resetting may cause data loss. Before doing so, please make sure important data and information has been backed up.

Do the following to reset X-431 Throttle:

1. Tap “Settings” -> “Back & Reset”.
2. Tap “Factory data reset”.
3. Tap “Reset tablet”.
4. Tap “Clear all data” to start resetting until the tool automatically reboots.

7. The diagnostic application is failing.

1. Press the Home key on the tool.
2. Select “Settings”-> “Apps”.
3. Select the application name from the Apps list.
4. Select “Force Stop”, and then press “OK” to confirm.
5. Select “Clear Data”, and then press “OK” to confirm.

Warranty

THIS WARRANTY IS EXPRESSLY LIMITED TO PERSONS WHO PURCHASE LAUNCH PRODUCTS FOR PURPOSES OF RESALE OR USE IN THE ORDINARY COURSE OF THE BUYER'S BUSINESS.

LAUNCH electronic product is warranted against defects in materials and workmanship for one year from date of delivery to the user.

This warranty does not cover any part that has been abused, altered, used for a purpose other than for which it was intended, or used in a manner inconsistent with instructions regarding use. The exclusive remedy for any automotive meter found to be defective is repair or replacement, and LAUNCH shall not be liable for any consequential or incidental damages.

Final determination of defects shall be made by LAUNCH in accordance with procedures established by LAUNCH. No agent, employee, or representative of LAUNCH has any authority to bind LAUNCH to any affirmation, representation, or warranty concerning LAUNCH automotive meters, except as stated herein.

Disclaimer

The above warranty is in lieu of any other warranty, expressed or implied, including any warranty of merchantability or fitness for a particular purpose.

Purchase Order

Replaceable and optional parts can be ordered directly from your LAUNCH authorized tool supplier. Your order should include the following information:

- Order quantity
- Part number
- Part name

Customer Service

If you have any questions or comments please forward them to:

LAUNCH Tech USA

Product Support

Phone: 877-528-6249 xt: 4

E-mail: support@launchtechusa.com

Fax: 562-463-1590

Monday - Friday 5 am - 5 pm PST

Service & Repair

Phone: 877-528-6249 xt: 5

Monday - Friday 8 am - 5 pm PST

If your unit requires repair service, return it to the manufacturer with a copy of the sales receipt and a note describing the problem. If the unit is determined to be in warranty, it will be repaired or replaced at no charge. If the unit is determined to be out of warranty, it will be repaired for a nominal service charge plus return freight. Send the unit pre-paid to:

Attn: LAUNCH Tech USA

1820 South Milliken Ave.

Ontario, CA 91761

FCC Warning:
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.

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

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 SAR limit of USA (FCC) is 1.6 W/kg averaged over one gram of tissue.
Device types X-431 THROTTLE (FCC ID: XUJPADV) has also been tested against this SAR limit. The Max simultaneous SAR is 0.68 W/kg. This device was tested for typical body-worn operations with the back of the handset kept 10mm from the body. To maintain compliance with FCC RF exposure requirements, use accessories that maintain a 10mm separation distance between the user's body and the back of the handset. The use of belt clips, holsters and similar accessories should not contain metallic components in its assembly. The use of accessories that do not satisfy these requirements may not comply with FCC RF exposure requirements, and should be avoided.

For 5G frequency band, operations in the 5150-5250 and 5725-5850 band are restricted to indoor usage only.

Any emission is maintained within the band of operation under all conditions of normal operation. The max. frequency stability is less than 20ppm.