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Safety Precautions

Before using X-431 PADII, please read the following safety information carefully.

- Never collide, throw, or punch X-431 PADII, and avoid falling, extruding and blending it.
- Do not use X-431 PADII in exceptionally cold or hot, dusty, damp or dry environments.
- In places where X-431 PADII is forbidden or using X-431 PADII may cause interference or generate a potential risk, please turn it off.
- To ensure a safe driving, please do not use X-431 PADII while driving.
- Turn off X-431 PADII before boarding any airplane.
- Do not dismantle X-431 PADII by yourself. If there is any inquiry, please contact the dealer.
- Never place X-431 PADII into apparatus with strong electromagnetic field.
- Keep X-431 PADII far away from magnetic devices because its radiations may erase the data stored on X-431 PADII.
- Store X-431 PADII out of reach of children and do not allow children to use it unsupervised.
- Please use the included battery and charger. Otherwise, explosion may happen.
- Do not disconnect power abruptly when X-431 PADII is being

formatted or in process of uploading or downloading. Or else it may result in program error.

Precautions on Using X-431 PADII

- The ignition switch should be OFF while plugging or unplugging the diagnostic connector.
- When the diagnostic connector is not used, remember to place it into the diagnostic connector housing located on the docking station to avoid loss.
- If your vehicle keeps unattended for a week or a long period, it is suggested to unplug the connector from vehicle's DLC to save battery power.
- While diagnosing a vehicle, you are not advised to use phone or messaging, because it may cause a data communication interruption. If it happens, it is abnormal and just try to re-do it.

Precautions on Operating Vehicle's ECU

- Do not disconnect the vehicle inner consumer when the ignition switch is ON. High voltage transients may encounter at the moment of disconnecting, which may damage the sensors and the ECU.
- Protect the computer from magnetic object.
- Do cut off the power supply of ECU system before welding on the vehicle.
- Pay more attention to the ECU and the sensors when the operation is next to them.
- Ground yourself when you disassemble PROM, otherwise ECU and sensors will be damaged by static electricity.
- Do connect ECU harness connector firmly, otherwise electronic elements, such as IC inside ECU, will be damaged.

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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.

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

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

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

1 Introduction

1.1 Product Profile

X-431 PADII is a new Android-based vehicle trouble diagnostic device developed for internet applications. It inherits from LAUNCH's advanced diagnosing technology and is characterized by covering a wide range of vehicles, featuring powerful functions, and providing precise test result.

Through the Bluetooth communication between vehicle diagnostic connector and variant mobile intelligent terminals, it achieves X-431 series full car model and full system vehicle trouble diagnosis, which include Reading DTCs, Clearing DTCs, Reading Data Stream, Actuation Test and Special Functions.

Meanwhile, taking advantage of mobile internet, it integrates more application and service, such as Customer Management, Maintenance Database and Update etc.

X-431 PADII adopts a higher performance-price ratio tablet, which is equipped with Android 4.2 operating system, 1.2GHz quad core CPU and 10.1" IPS screen display.

1.2 Features

1. Diagnose:

A. Diagnose: Diagnose the electronic control system of prevailing vehicle models covering Asian, European, American and Chinese. Diagnosis functions include: Read DTCs, Clear DTCs, Read Data Stream, Special Functions etc;

B. Maintenance Database: Built-in abundant maintenance database helps repair professionals diagnose and repair vehicles efficiently, accurately and profitably.

C. Customers Management: This feature allows you to manage

your golo customers much better, who are bound to and assigned by repair shop. Remote assistance and message sending are supported.

D. Update: Lets you update your diagnostic software more efficiently.

E. golo IM: Configures X-431 PADII as an IM (Instant Messaging) tool, which enables technicians to exchange repair experience and perform remote assistance more conveniently;

2. Wi-Fi connection and Ethernet connection are supported;
3. Web browser: Users can make online search and visit any website;
4. HDMI interface is provided for connecting the external projectors or displays;
5. Equipped with USB port for connecting USB devices and other add-on modules such as Scopebox, Sensorbox and Batterybox;
6. Other Android-based applications can be customized to install or uninstall;
7. File Manager: Lets you manage files or downloaded files stored in SD card efficiently;
8. Settings: To configure your personalized X-431 PADII.

1.3 Technical Specifications

A. X-431 PADII Tablet

Item	Description
Operating system	Android 4.2
CPU	Quad-core Processor, 1.2GHz
Display	10.1 inch IPS touch screen with 1280 x 800P resolution
Memory	2GB
Hard disk	32GB SSD

Connectivity

- Wi-Fi (802.11 b/g/n)
- USB: 2.0
- Bluetooth 2.0

Camera

Front-facing, 2.0 megapixel; Rear-facing, 5.0 megapixel, AF with Flashlight

Sensor

Gravity Accelerometer

Audio Input/Output

- Microphone
- Speakers
- 3.5mm stereo headset jack

Video Output

HDMI (The following are supported:)
HDMI 480P 640*480 VGA (Default)
HDMI 720P 1280*720 WXGA
HDMI 1080I 60HZ 1920*1080 WUXGA
HDMI 1080P 1920*1080 WUXGA
Only HDMI with P (stands for a refresh frequency of 60Hz) are supported.

Power and Battery

12000 mAh lithium-polymer battery
Charging via 5V DC power supply

Operating Temperature

-10°C ~ 55°C (14 ~131°F)

Storage Temperature

-20°C ~ 70°C (-4 ~158°F)

B. Diagnostic Connector

Item	Description
Working temperature	-10°C ~ 55°C (14 ~131°F)
Storage temperature	-20°C ~ 70°C (-4 ~158°F)
Relative humidity	20% ~ 90%

2 Knowledge of X-431 PADII

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

- X-431 PADII Tablet -- the central processor and monitor for the system (For details, please refer to Chapter 2.1.)



Fig. 2-1

- X-431 PADII Docking Station -- the platform for charging X-431 PADII tablet (For details, please refer to Chapter 2.2.)



Fig. 2-2

- Diagnostic Connector -- the device for accessing vehicle data (For details, please refer to Chapter 2.3.)



Fig. 2-3

2.1 X-431 PADII Tablet

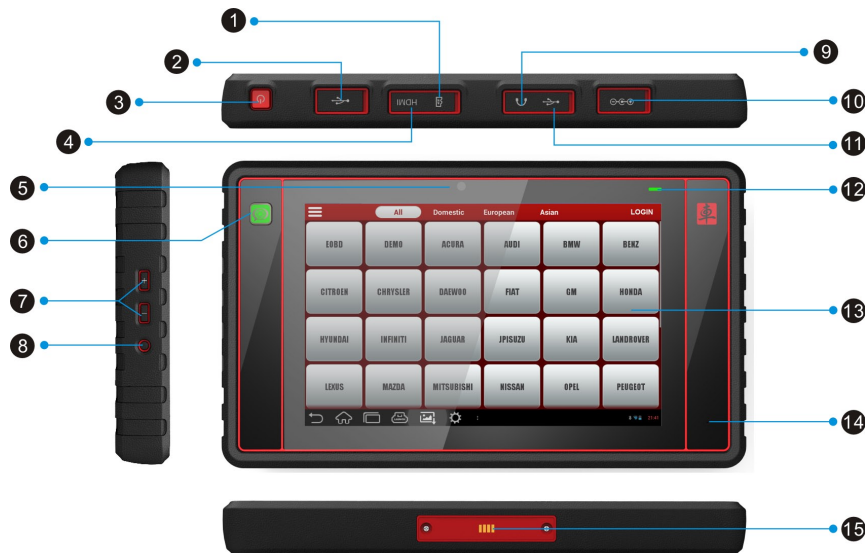


Fig. 2-4 X-431 PADII Tablet (front & side view)

Notes:

1. USB Port is reserved for add-on modules, and other USB devices use only. Micro USB Port is reserved for Micro USB cable only.
2. It illuminates red while X-431 PADII tablet is charging. Once charging is finished, it will turn green.

Table 2-1 formulates interfaces and indicators of X-431 PADII tablet (front):

No.	Name & Descriptions
1	Micro SD Card Slot -- To store the SD card.
2	USB Port ¹ (See Note1*)
3	Screen Lock/Power Button -- To turn the tablet on/off with long press, or lock/wake up the screen with short press.
4	Mini HDMI Port -- To connect to an external projector or monitor with HDMI interface.
5	Front Camera
6	go! Button -- For quick access to IM (Instant Messaging) application.
7	Volume Buttons -- To adjust the volume.
8	Reset Button -- To reset X-431 PADII.
9	Headphone Jack
10	DC IN Port -- To connect the included power adaptor.
11	Micro USB Port (See Note1*)
12	Charging indicator ² (See Note2*)
13	IPS Touch Screen
14	Microphone
15	Charging Slot -- To recharge X-431 PADII.

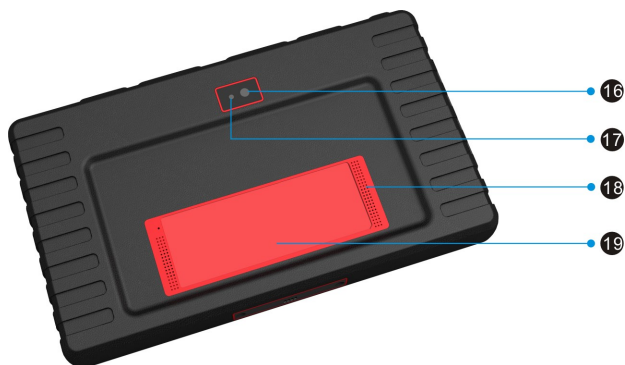


Fig. 2-5 X-431 PADII Tablet (rear view)

2.2 X-431 PADII Docking Station



Fig. 2-6 X-431 PADII Docking Station

Table 2-2 formulates parts of X-431 PADII tablet (rear):

No.	Name & Descriptions
16	Rear Camera
17	Camera Flash
18	Audio Speaker
19	Battery

Table 2-3 formulates ports of X-431 PADII docking station

No.	Name & Descriptions
1	Charging Slot -- To charge the tablet.
2	Powered OBD16 Socket -- Plug the diagnostic connector into this socket for demo experience when the docking station is connected to the AC outlet.
3	Power Interface -- To connect the power cord to AC outlet for supplying power to docking station.
4	OBD16 Sockets Without Power Output -- For housing other idle diagnostic connectors.

2.3 Diagnostic Connector



Fig. 2-7 Diagnostic Connector

Table 2-4 formulates ports and indicators of diagnostic connector:

No.	Name & Descriptions
1	OBD-16 Diagnostic Connector -- To connect on vehicle's OBD2 DLC.
2	Power Indicator -- It lights up while the connector is plugged into the vehicle's DLC.
3	Communication Indicator -- It will flash once the connector is communicating with X-431 PADII or it is being reset.
4	Micro USB Port -- To connect on PC for data transmission or upgrade via USB cable.

2.4 X-431 PADII Accessory Checklist

Common accessories for each X-431 PADII are same, but for different destinations, the accessories of X-431 PADII (such as diagnostic

software, testing connectors) may vary. Please consult from the local agency or check the package list supplied with X-431 PADII together.

Table 2-5 -- X-431 PADII common accessories and descriptions

No.	Name	Qt.	Picture
1	X-431 PADII Tablet	1	
2	Diagnostic Connector	1	 (To connect to vehicle's DLC.)
3	Docking Station	1	
4	Micro USB Cable	1	 (To connect on PC for data transmission or upgrade diagnostic connector)
5	Cigarette Lighter Cable	1	 (To obtain power supply from vehicle's cigarette lighter)



6	Power Adaptor	1	 (To convert 100~240V AC power supply to 5V DC power supply.)
7	HDMI Cable	1	 (To connect to an external projector or monitor with HDMI interface.)
8	Battery Clamps Cable	1	 (To provide power to the non-16 pin connector through connection to the vehicle's battery.)
9	OBD II Extension Cable	1	 (To connect the diagnostic connector for extension purpose.)

10	OBD I Converter	1	 (A converting cable for connecting non-16 pin connector.)
11	Password Envelope	1	 (A piece of paper bearing Product S/N and Verification Code, which is required for your registration.)
12	Non-16pin Connector		(Optional)

3 Preparations

3.1 Charging X-431 PADII

Choose any one of the followings to charge your X-431 PADII:

- A. Use the included 5V power adaptor: Connect one end of the power adaptor to DC IN port of X-431 PADII, then connect the other end to the AC outlet. **Never use other similar adaptors to charge X-431 PADII.**
- B. Use the docking station: Follow the steps described as below to charge your X-431 PADII:
 1. Locate the charging slot on the bottom of X-431 PADII tablet and the docking station. See Fig. 3-1 & Fig. 3-2.



Fig. 3-1



Fig. 3-2

2. Align the charging slots, and then dock the tablet into the station to ensure that it firmly sits on the docking station. Refer to Fig. 3-3.



Fig. 3-3

3. Insert one end of the included power cord of the docking station into the power jack, then plug the other end into the AC outlet. If  appears on the screen, it indicates it is being charged.
4. If the logo changes into , it indicates that the battery is fully charged. Disconnect the docking station from the AC outlet.

3.2 On Using Your Battery

- If the battery keeps unused for a long time or battery is completely discharged, it is normal in case it can not be turned on while being charged. Please charge it for a period and then turn it on.
- Please use the included power adaptor to charge your X-431 PADII. We assume no responsibility for damage or loss resulting from using other similar adaptors other than the specified one.
- The charging time of battery varies with temperature condition and battery consumption status.
- While X-431 PADII has low battery, a beep will sound. If it is very low, X-431 PADII will be switched off automatically.

3.3 Power On / Power Off X-431 PADII

3.3.1 Power on

Press the POWER key to turn on X-431 PADII.

 **Note:** If it is the first time you use X-431 PADII or X-431 PADII keeps idle for a long time, X-431 PADII could fail to be turned on. It results from low battery. In this case, please recharge your X-431 PADII for a while and try to turn it on.

3.3.2 Power off

1. Press the POWER key, an option menu will pop up on the screen.
2. Tap "Power off" to turn off X-431 PADII.

3.4 Tips On Finger Operations

Actions	Results
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	Press 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 the screen

Many screen lock modes are available on X-431 PADII. Take the preset screen-lock mode as example for demonstration.

3.5.1 Lock the screen

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

3.5.2 Unlock the screen

Press POWER key to activate the screen, and then drag the lock to "Unlock" position.

Notes:

1. In case you forgot the screen lock, please refer to Appendix - FAQ for details. You are not suggested to use the screen lock.
2. If you use unlock pattern, you have to draw the right target pattern to unlock it.

3.6 Screen Layout

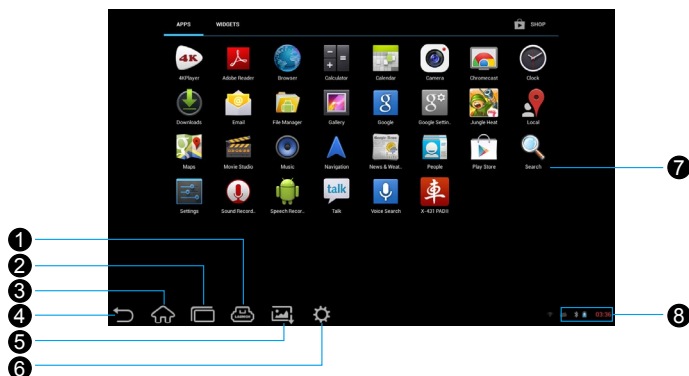


Fig. 3-4

On-screen keys and status bar are as follows:

- 1  shows whether the diagnostic connector is properly connected or not.
- 2 Tap  to display a list of applications that are currently running or recently used. To open an application, tap it. To remove an application, swipe it upwards.
- 3 Tap  to jump to the Android System's home screen.
- 4 Tap  to return to the previous screen or exit the application.
- 5 Tap  to capture the current screen and all captured screenshots are stored in the Screenshots folder.
- 6 Tap  to configure the X-431 PADII system settings.

- 7 Display the widget and application icons.
- 8 It shows: System time, Wi-Fi connection status and signal strength, battery status and other information. Tap the digital clock to open the notice panel.

3.7 Status Bar

For some common indicators, please see the following table.

Icons	Definitions	Icons	Definitions
	Airplane mode		Bluetooth is on
	Positioning GPS		Charging
	Battery is fully charged		Low battery
	New mail		Preparing SD card
	Uploading		Downloading
	Connected to a PC		USB bound is activated
	Available Wi-Fi is detected		Connected to Wi-Fi

Notes: When the  icon appears on the status bar, please charge it immediately.

3.8 Notification bar

The notification bar is used to display some activities, such as new messages, to do list and running tasks. You can also open the notification bar to view the reminder or activity notification.

3.9 Customize your desktop

3.9.1 Move items on the desktop

1. Tap and hold the item to be moved until it is shaken.
2. Drag and drop it to the target location.

 **Note:** Drag the icon to the margin of the screen and keep it still, the system will switch to other extension desktop, place it to the desired location.

3.9.2 Delete items from the desktop

1. Tap and hold the item to be moved until it is shaken.
2. Drag it on the trash icon, then release it.

 **Warning:** Deleting an icon will uninstall the corresponding application. Please be careful to do so.

3.9.3 Change your wallpaper

1. Tap and hold a blank area on the desktop, a pop-up wallpaper window will be shown on the screen.
2. Set different wallpaper as desired:
 - **Wallpapers:** Choose a still picture from gallery as wallpaper.
 - **Live Wallpapers:** Open it to choose one of the preset live wallpapers as wallpaper.
 - **Gallery:** Set the photos you captured as wallpaper.

3.9.4 Adjust brightness

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

1. On the main menu screen, tap Settings > Display > Brightness.
2. Drag the slider to adjust it as desired.

3.9.5 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 main menu screen, tap Settings > Display > Sleep.
2. Choose the desired sleep time.

3.9.6 Set screen lock

This function is designed to lock the screen and buttons to avoid accidental operations while X-431 PADII keeps unattended.

1. On the main menu screen, tap Settings > Security > Screen lock.
2. Choose the desired screen lock mode and follow the on-screen instructions to finish your setting.

 **Note:** You are recommended to set screen lock as "None". In case you forgot the screen lock, please refer to Appendix - FAQ for details.

3.9.7 Adjust the volume

This option enables you to adjust the volume of the ringtones, media player, alarm and notice.

1. On the main menu screen, tap Settings > Sound > Volume.
2. Drag the slider to adjust it.

 **Note:** Alternatively, you can also press the volume keys to control the volume of the current application.

3.10 Input Method

3.10.1 Activate / hide on-screen keyboard

By default, Android keyboard is available on X-431 PADII.

- To input text, tap the input box and the on-screen keyboard will be activated automatically.
- After inputting, tap ✓ to hide the keyboard.

 **Note:** In some applications, the on-screen keyboard may appear over some interfaces partially. Close it to view more so that you can decide what to do next.

3.10.2 Edit text

Cut, copy and paste operations are supported.

1. Tap and hold the desired text area until a blue cursor appears.
2. Press and drag the cursor to highlight the text to be edited.
3. Tap SELECT ALL, CUT or COPY to perform the corresponding operations. To delete the selected text, tap the delete key on the keyboard.

3.10.3 Android input method

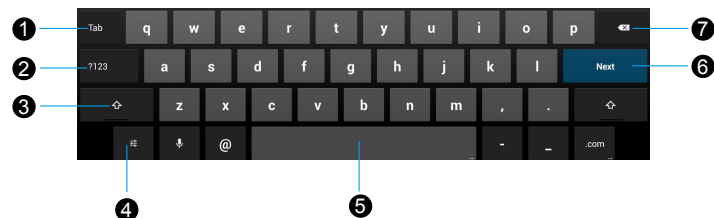


Fig. 3-5

- | | |
|---|---|
| 4 | To bring up an input options menu. Input languages and Android keyboard settings such as auto-capitalization and sound on keypress are available. |
| 5 | To enter a space. |
| 6 | Line feed. |
| 7 | > To delete the character before the cursor.
> Long-press this key to delete all characters before the cursor. |

 **Note:** For different input box, keyboard layout may vary. The figure shown as above is provided for reference purpose.

- | | |
|---|--|
| 1 | To jump to next textbox. |
| 2 | To switch to numeric & symbol keyboard. |
| 3 | To toggle between upper case and lower case. |

4 Wi-Fi Setting

Note: Once Wi-Fi is set as ON, X-431 PADII will consume more power. While Wi-Fi keeps unused, please set it off to save power.

1. On the main menu screen, tap Settings > Wi-Fi.

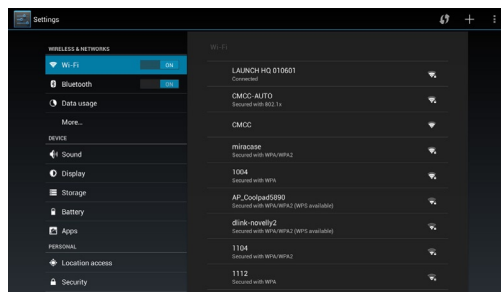


Fig. 4-1

2. Tap or slide the Wi-Fi switch to ON, X-431 PADII starts searching all available wireless LANs.
3. Choose the desired Wi-Fi,
 - If the network you chose is open, you can connect on it directly;
 - If the selected network is encrypted and secured with WPA, you have to input the right access password to connect.

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

When X-431 PADII is in range of the WLAN, it will connect to the previously linked network automatically.

5 How to diagnose

5.1 Connections

5.1.1 Preparation

Normal testing conditions

- Turn on the vehicle power supply.
- Vehicle battery voltage range should be 9-14V and working voltage of X-431 PADII is 5V.
- Throttle should be closed at its close position.
- Ignition timing and idle speed should be within specified range; water and transmission oil temperature are within normal working range (water temperature is 90-110°C and transmission oil temperature is 50-80°C).

Select testing connectors

If X-431 PADII is testing vehicles equipped with universal OBD II 16 PIN diagnostic socket, please use the included diagnostic connector. (For vehicles with non-OBD II 16 PIN diagnostic socket, a non-16 PIN connector is required.)

5.1.2 DLC Location

The DLC (Data Link Connector or Diagnostic Link Connector) is the standardized 16-cavity 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.

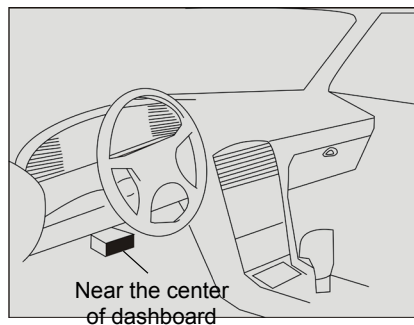


Fig. 5-1

5.1.3 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 diagnostic connector into the vehicle's DLC socket (It is suggested to use the OBD II extension cable to connect the diagnostic 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 PADII tablet, and the other end to AC outlet.

B. Internal battery pack: For details on how to recharge X-431 PADII, see "**Chapter 3.1 Charging X-431 PADII**".

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, then connect the other end to the OBD I converter, and then tighten the captive screws.
4. Connect the other end of the converter to the included diagnostic connector.
5. To supply power to OBD I converter from:

A. Cigarette Lighter: 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 converter.



Fig. 5-2

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 converter.



Fig. 5-3

5.2 Bluetooth Setting

Enter X-431 PADII Bluetooth setting screen ("Settings" --> "WIRELESS & NETWORK" --> "Bluetooth"), slide the Bluetooth switch to ON and X-431 PADII will start searching available Bluetooth device, tap the desired connector to pair and match.

By default, the Bluetooth name is 98429*****00 (where ***** stands for 5 digits.).

Note: In case no Bluetooth setting is done before diagnostic software is launched, you can also configure it while using the software. For details on Bluetooth connection, please refer to "Chapter 5.6 Start diagnosing".

5.3 Diagnosis Flowchart

For new users, please follow the operation chart shown in Fig. 5-4 to get familiar with and start using X-431 PADII.

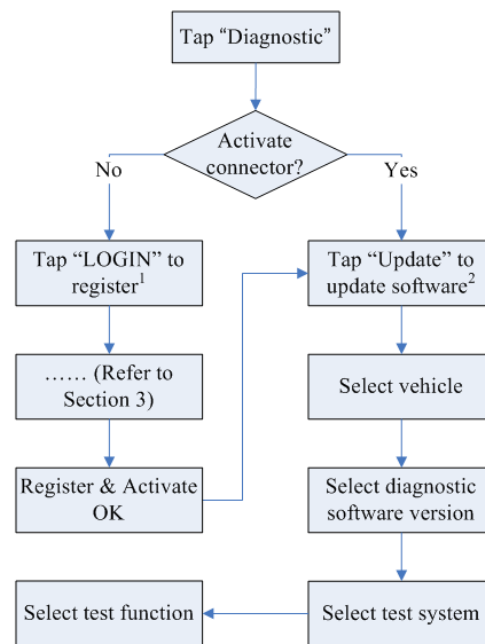
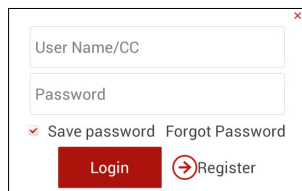


Fig. 5-4

5.4 User Registration & Connector Activation

5.4.1 User registration

Tap the  icon on the desktop to launch the application, a disclaimer page will pop up on the window. Tap "I Agree" to enter the login interface of diagnosis software, as indicated in Fig. 5-5.



User Name/CC

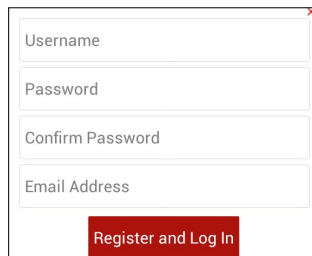
Password

☒ Save password [Forgot Password](#)

[Login](#) [Register](#)

Fig. 5-5

1. If you are a new user, tap “Register” to enter registration page. See Fig. 5-6.



Username

Password

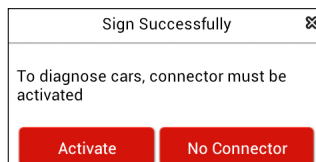
Confirm Password

Email Address

[Register and Log In](#)

Fig. 5-6

In Fig. 5-6, fill in the information in each field. After inputting, tap “Register and Log In”, a prompt message similar to the following will appear:



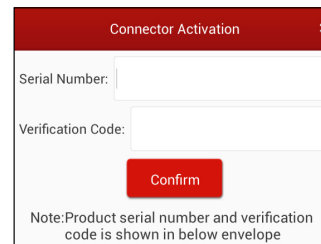
Sign Successfully

To diagnose cars, connector must be activated

[Activate](#) [No Connector](#)

Fig. 5-7

In Fig. 5-7, tap “Activate” if you want to experience vehicle diagnostic software. See Fig. 5-8.



Connector Activation

Serial Number:

Verification Code:

[Confirm](#)

Note: Product serial number and verification code is shown in below envelope

Fig. 5-8

To exit and register it later, tap “No connector”.

Input the Serial Number and Verification Code, and then tap “Confirm”.

Note: The Serial Number and Verification Code can be obtained from the password envelope. See Fig. 5-9.

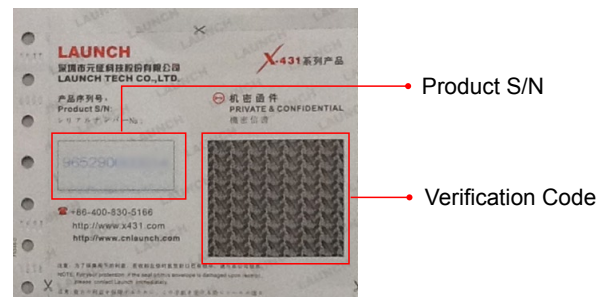


Fig. 5-9

Alternatively, you can also activate your connector by tapping “Connector Activation” in “Profile”. For details, please refer to Chapter 5.7.3 Activate Connector.

2. If you have registered to be a member, input your name/CC and password in Fig. 5-5, and then tap the “LOGIN” button to enter the main menu screen directly.

5.4.2 Diagnostic software layout

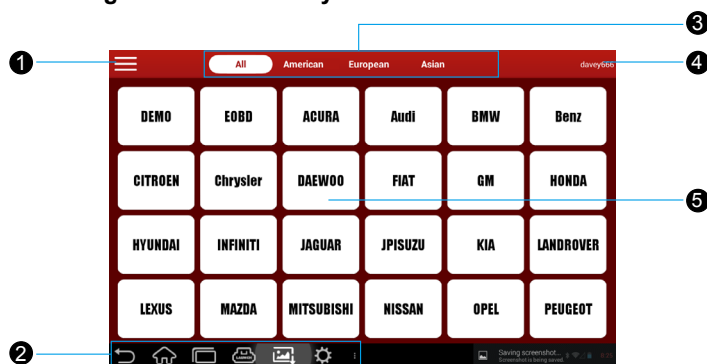


Fig. 5-10

- 1 Tap  to pull down all function menu. Refer to “Chapter 5.4.3 Function menu” for details.
- 2 Short-cut button bar: Refer to “Chapter 3.6 Screen Layout” for detailed illustration.
- 3 Vehicle region buttons: Tap different buttons to switch to corresponding vehicles.

- 4 Login button: Tap it to login or register the diagnostic system. Once users have logged in successfully, it will change to your user name.
- 5 Vehicle diagnosis software logo: To start diagnosing a vehicle, you have to download the corresponding diagnostic software.
For details on downloading/updating a software, please refer to “Chapter 5.5 Download / Update Diagnostic Software”.

5.4.3 Function menu

Tap  to unfold function menu, it mainly includes the following items:

Name	Description
Diagnose	Configures X-431 PADII to operate as a diagnostic tool.
Maintenance Database	Provides a mass of service information for various vehicle models, which enables users to retrieve service data of some vehicle online.
Profile	Accesses to My Report, Connector Activation, Private information and Settings etc.

More	Messages	To launch IM (Instant Messaging) application.
	Contacts	To manage your friend and accounts.
	Update	To download or update vehicle software.
	Setting	Allows you to configure system settings.
	Chrome	Launches the Chrome browser.
	Camera	Opens the camera.
	Oscilloscope (Optional)	To determine vehicle electrical equipment and circuit trouble.
	Sensor (Optional)	To diagnose/simulate vehicle ECU sensor trouble.
	Multimeter (Optional)	To measure physical parameters such as voltage, resistance, frequency etc.
	Battery Test (Optional)	To test whether vehicle's battery is good or not.
	Borescope (Optional)	To check unseen or unreachable parts or components.

5.5 Download/ Update Diagnostic Software

Before diagnosing a vehicle, you have to download the corresponding vehicle diagnosis software.

On function menu, tap “Update” to select the paired diagnostic connector. Tap the serial number and a list of diagnostic software will pop up on the screen.

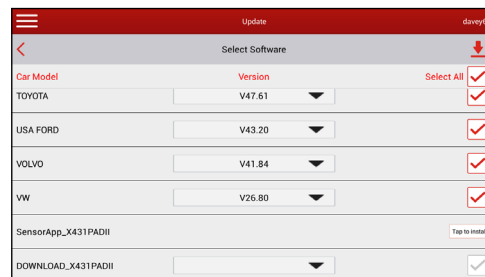


Fig. 5-11

By default, all diagnostic software are selected. To select certain software, tap “Select All”, and then uncheck the box next to Version. Tap  to start downloading.

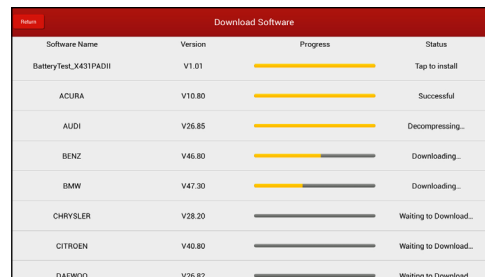


Fig. 5-12

Once downloading finished, the software packages will be installed automatically.

 **Note:** If applications of extending modules are downloaded, the system will decompress it automatically. In this case, tap it to install it.

Tap  to return to the function selection screen.

5.6 Start Diagnosing

Tap  on the main menu screen, and then choose “Diagnose” to enter the vehicle selection page.

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

1. Tap the “DEMO” logo, the system will prompt you to make Bluetooth pair firstly (See Fig. 5-13). Since Bluetooth is not required for DEMO program, just tap “DEMO SHOW” to proceed to Step 2.

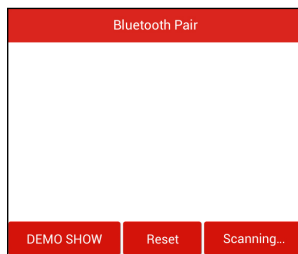


Fig. 5-13

 **Note:** Generally you have to match and pair Bluetooth while diagnosing a certain vehicle. If Bluetooth pair has been done, “Not Connected” but “Paired” will appear on the screen. Tap the desired connector to start connecting. If successful, a pop-up message “Connected to 98429*****00” will be shown.

2. After Bluetooth is properly connected, the system will enter software version selection screen. See Fig. 5-14.



Fig. 5-14

To check whether a new version is available or not, tap “Check Latest Version”. If a newer version is detected, it will start downloading the latest version.

3. Tap the desired version to start initializing. After initializing is complete, the screen will display as below:

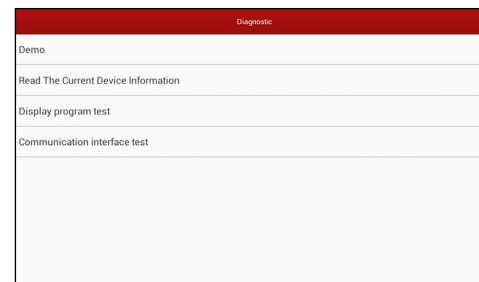


Fig. 5-15

- 4 Tap “Demo” to enter system selection interface. See Fig. 5-16.

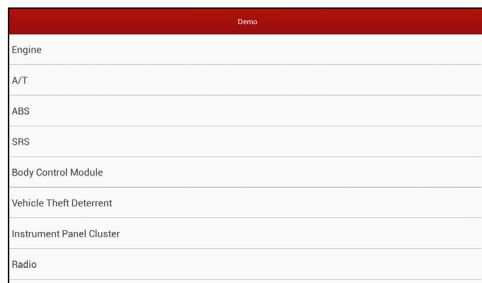


Fig. 5-16

5. Tap “Engine”, the system will jump to the function menu. See Fig. 5-17.

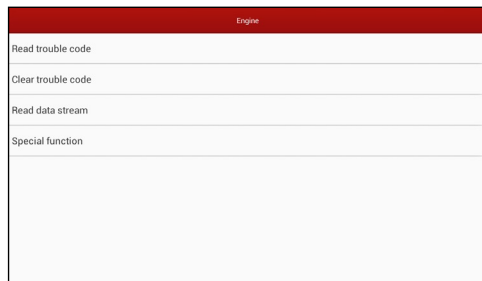


Fig. 5-17

To return to the previous screen, tap .

5.6.1 Read Trouble Code

Tap “Read Trouble Code” in function menu, the screen will display the diagnostic result.

Reports: To save the current data in text format.

Screenshot Reports: To save the current data in screenshot form.

Tap  to return to the function selection screen.

5.6.2 Clear Trouble Code

Tap “Clear Trouble Code” function menu, the system will automatically delete the currently existing trouble code.

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

5.6.3 Read Data Stream

Tap “Read Data Stream” in function menu, the system will display data stream items.

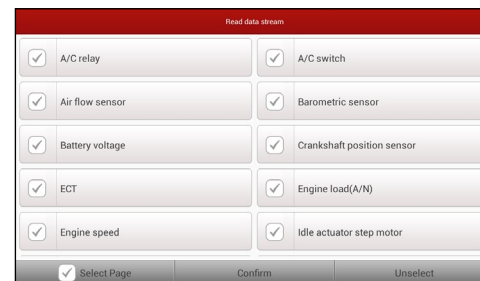
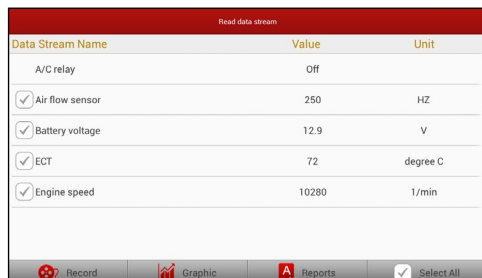


Fig. 5-18

To select certain data stream item, just tap , then the selected item will be activated and  will change into .

To select all items of the current screen, tap “Select Page”, and then tap “Confirm” to enter data stream reading interface. See Fig. 5-19.

To deselect all items, tap “unselect”.



Data Stream Name	Value	Unit
A/C relay	Off	
☒ Air flow sensor	250	HZ
☒ Battery voltage	12.9	V
☒ ECT	72	degree C
☒ Engine speed	10280	1/min

Fig. 5-19

On data stream reading page, the following operations can be done:

Select All: Tap it to select all data stream items.

Graphic: After selecting, tap it to view the waveform.

Record: Tap to start recording diagnostic data for future playback and view. 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 "My Report" under  menu. For details on playback operations, please refer to Chapter 5.7.1 "My Report".

To stop reading the data stream, tap "Stop".

Reports: To save the current data in text format.

Tap  to return to the function selection screen.

5.6.4 Special Function

This option allows you to detect whether the system parameters are normal or not. It mainly includes: Injector test, fuel pump test, purge control solenoid and so on.

Take "1# injector" as an example.

To detect whether 1# injector works normally or not, tap "1# injector", the system will automatically carry out the function. After complete, a prompt dialog box will pop up on the screen.

5.7 Profile

This function allows users to manage your personal information.

5.7.1 My Report

This option is used to view the diagnostic report generated in process of vehicle diagnosis. Additionally, delete, send operations are also supported.

Tap "**My Report**", a list of diagnostic report will appear below the tab.

If user records the running parameters while reading data stream, it will be saved as .x431 file and appear under Diagnose Playback tab.

In case the DTC result is saved as .jpg or .txt file on Read Trouble Code page, .jpg files and .txt files will be displayed under Reports tab.

Tap certain diagnostic report (.txt) to view it.

On-Screen button definitions:

 Rename: To rename the current report;

 Delete: To delete the current report.

Tap certain diagnosis playback file (.x431) to view it.

On-Screen button definitions:

 Delete: To delete the current report;

 Value: To view the diagnostic report in value form.

 Graphic: To view the diagnostic report in waveform form.

5.7.2 Activate Connector

It is used to activate your diagnostic connector.

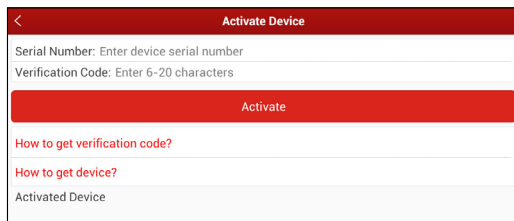


Fig. 5-20

Input the Serial Number and Verification Code, and then tap “**Activate**” to activate the connector.

For details on how to obtain Serial Number and Verification Code, tap the links below to get help.

5.7.3 Private Information

Use this item to view and configure personal information.

5.7.4 Settings

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

App Settings: This item allows you to set the measurement unit.

About: Version Information, Version Update, Quick Start Guide, User Manual are included.

5.7.5 Log Out

This option allows you to logout the system.

To logout the current user ID, tap “**Log Out**”.

6 Sensorbox (Optional)

6.1 Product summary

X-431 PADII 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, 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

6.2 Structure and Accessories

6.2.1 Sensorbox structure

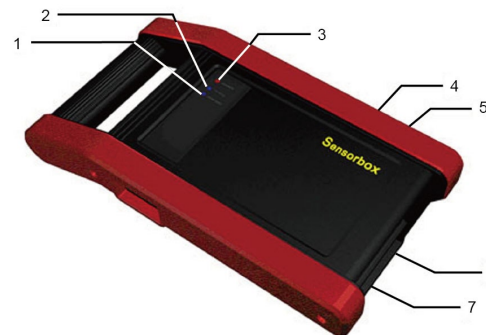


Fig. 6-1 Structural diagram of Sensorbox

Table 6-1 shows the ports and indicators for X-431 PADII 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 Sensorbox is powered on.
4	B type 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

6.2.2 Sensorbox accessories

X-431 PADII sensorbox accessories include sensor test cable, probe etc. See Table 6-2.

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 2-2 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	

6.3 Sensor Simulation

6.3.1 Connections

1. Firstly, power on the main unit (Connect one end of the power adaptor into the DC IN port of X-431 PADII tablet, and the other end to the AC outlet.);
2. Plug one end of the sensor test cable (black) into the “COM” interface of the sensorbox, then connect 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 connect the other end to the test probe or electronic control converting cable.

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

6.3.2 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 6.3.1 for details), power on your X-431 PADII, launch X-431 PADII application and enter the function menu interface, then tap "Sensor" to enter the test selection screen. See Fig. 6-2.

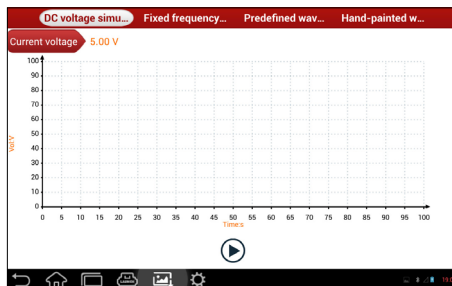


Fig. 6-2

1. DC voltage simulation

In Fig. 6-2, 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 play button, then the X-431 PADII 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. 6-2, tap "Fixed frequency simulation" to enter a screen similar to Fig. 6-3.



Fig.6-3

Tap the setting option tab, then tap "+" or "-" to adjust the output, After setting, tap play button to perform the test.

3. Predefined waveform simulation

X-431 PADII 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 play button to start simulating output of corresponding sensor waveform and no more parameter settings of simulation waveform are required.

In Fig. 6-3, tap “Predefined waveform simulation” to enter the screen shown as Fig. 6-4.

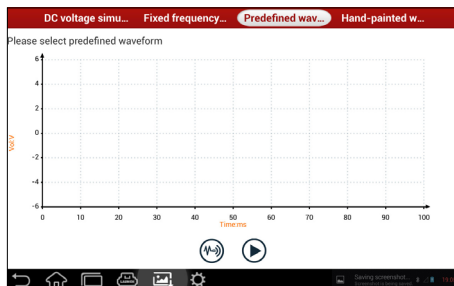


Fig. 6-4

Here, tap  button, a screen similar to Fig. 6-5 will appear.

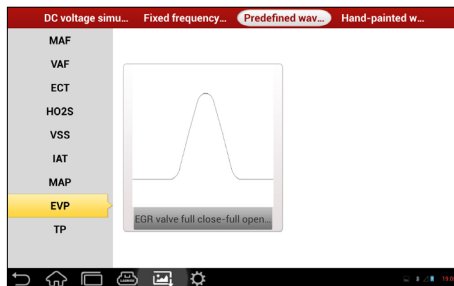


Fig. 6-5

In Fig. 6-5, 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. 6-5, the right screen will display the waveform of the sensor. See Fig. 6-6.

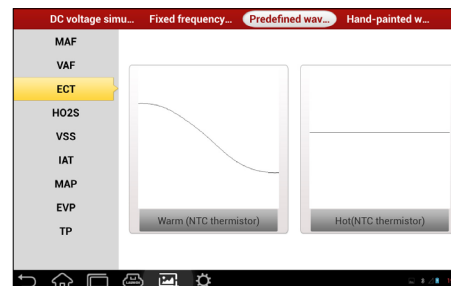


Fig. 6-6

In Fig. 6-6, tap the waveform, then the pre-defined waveform has been set. See Fig. 6-7.

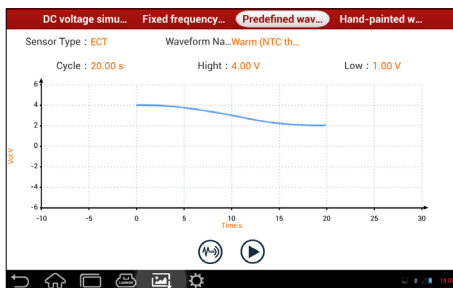


Fig. 6-7

In Fig. 6-7, 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 PADII will output a waveform as desired.

Warning: Just draw a complete periodic waveform (when it is outputted, 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. While drawing, just pay attention to the shape of waveform, high level, low level and period can be ignored, which can be set in the Configure option.

In Fig. 6-2, tap “Hand-painted waveform simulation”, a screen similar to Fig. 6-8 will appear.

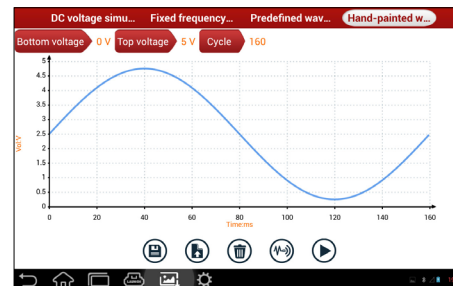


Fig. 6-8

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.

6.3.3 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 $1M\Omega$, 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.

6.4 Multimeter

6.4.1 Main Menu

Make sure X-431 PADII main unit and the sensorbox are properly connected (Refer to Chapter 6.3.1 Connections for details), power on X-431 PADII and enter the function menu interface, tap “Multimeter” to display the test menu. See Fig. 6-9.

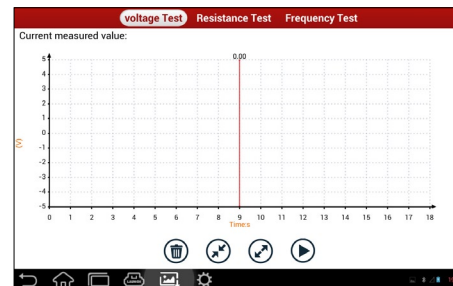


Fig. 6-9

Click the desired test as shown on Fig. 6-9 to perform related test.

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

Tap “Voltage test”, a screen similar to Fig. 6-10 appears:

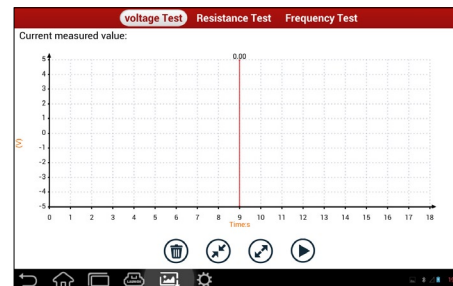


Fig. 6-10

The following operations can be done:

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

from the left.

[

[

[

6.4.2 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 $1k\Omega$ 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.

7 Batterybox (Optional)

7.1 Product Summary

X-431 PADII 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 7-1.

Table 7-1 Test standard

	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

7.2 Test Environment

7.2.1 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.

7.2.2 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 can not 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.
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7.3 Batterybox Structure and Test Accessories

7.3.1 Batterybox structure

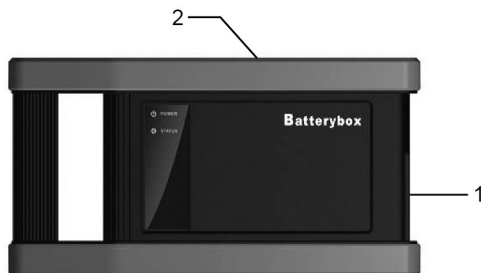


Fig.7-1 Batterybox structure diagram

Battery connector: Connect to battery for battery test.

B type USB terminal: Connect to the X-431 PADII tablet with a USB cable.

7.3.2 Test accessories



Fig. 7-2 Kelvin clip



Fig. 7-3 A/B cable

7.4. Connections & Operations

7.4.1 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 PADII tablet. This connection applies to outside the vehicle test and inside the vehicle.

Notes:

1. Wait about 10s 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.

7.4.2 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. 7-4.

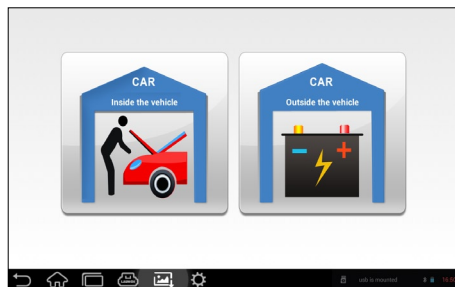


Fig. 7-4

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. See Fig. 7-5.

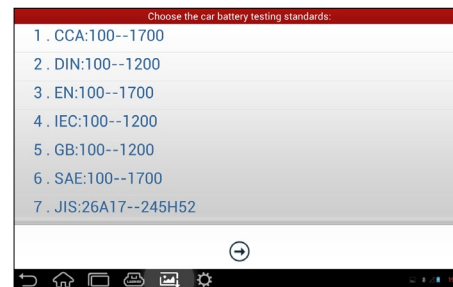


Fig. 7-5

6. Select a testing standard except for JIS and tap , a screen similar to Fig. 7-6 will appear. Users can adjust capacity size by tapping on < or > or by dragging the slider on the bar.

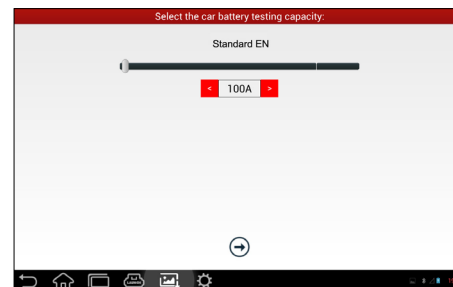


Fig. 7-6

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 following screen.

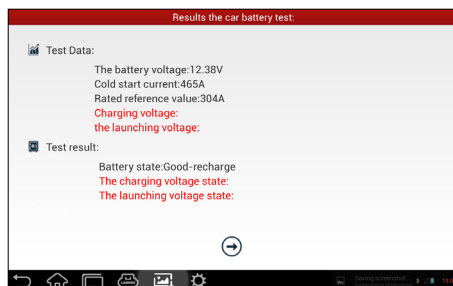


Fig. 7-7

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

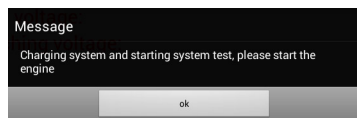


Fig. 7-8

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. 7-9.

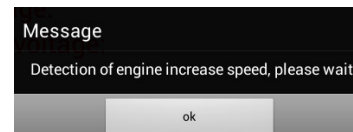


Fig. 7-9

Tap [OK], test data will be shown on the screen, similar to Fig. 7-10.

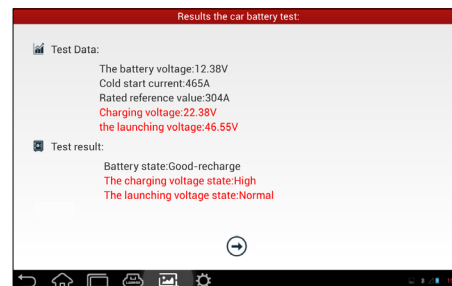


Fig. 7-10

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.

7.4.3 Outside the vehicle test

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

On Fig. 7-4, tap [Outside the vehicle] to select battery test standard.

The following operation steps are identical to Steps 6 ~ 7 in Chapter 7.4.2 Battery test. Please refer to it for details.

7.5 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 oscilloscope.

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.*

8 Oscilloscope (coming soon)

Oscilloscope is an optional function of X-431 PADII, including automotive oscilloscope and automotive ignition waveform.

Automotive oscilloscope can make the auto repair technician quickly judged 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 capture 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 played back 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 indexes 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.

9 Borescope (Optional)

Automotive borescope is mainly applied to those unseen parts of engine, fuel tank, braking system.

While testing a vehicle system, engine is one of the main parts to be checked. To check if the internal of a engine is qualified or not or whether internal carbon deposit and damage exists in the engine or not, we can make full use of a borescope to solve these quesitons.

X-431 PADII provides an optional function of borescope.

The borescope is mainly composed of an inspection camera, flexible tube and USB cable. The water-resistant camera lens with adjustable LED lights enables you to observe the parts that can not be seen in wet, dark, fluid soaked places. The included flexible tube is convenient for easy inspection and allows for access to hard-to-reach areas.

In addition, the captured pictures and videos also provide you intuitive data for easy analysis.

10 Others

10.1 Email

This function allows you to send and receive email. You can add POP3 or IMAP email account for some common web email service provider.

10.1.1 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 desktop, tap **Email**.
2. Input email address and password, tap “Next” or “Manual setup”.

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

3. Choose the desired email account type to enter the incoming settings screen, tap “Next”.
4. Follow the on-screen instructions to proceed until the system prompts you that the account setup has been finished.

10.1.2 Send an email

1. Enter main menu screen, and tap **Email** to enter account screen. If several email accounts are configured, choose the desired one.
2. Tap  to enter new mail writing interface. Input the receiver address in “To” field and a title in “Subject” column, and then type in the content in “Compose” email area.
3. After inputting, tap , you can perform any one of the followings: Attach file, add CC/BCC, save draft, discard and setting.
4. Tap  to send email.

10.1.3 View an email

1. Enter main menu screen, and tap **Email** to enter account screen.
2. Tap the desired email account.
3. Tap the desired one to read:

 **Note:** For different networks, inbox may have some delays. Tap  on the upper right corner to refresh the email list.

10.1.4 Delete an email

1. Enter main menu screen, and tap **Email** to enter account screen.
2. Tap the desired account, and then select the mail to be deleted.
3. Tap  to delete.

 **Note:** To delete multiple emails, check the box before the message and then tap . Once “Messages deleted” appear, it indicated the selected messages has been removed successfully.

10.1.5 Revise an account setting

1. Enter main menu screen, and tap **Email** to enter account screen.
2. Tap  > Settings.
3. Choose the desired Email account from the account list.
4. Follow the instructions on the screen to make general settings and notification settings.

 **Note:** Never change the default settings of the server, otherwise email failure may occur.

10.1.6 Delete an email account

Once Email account is removed, X-431 PADII stops receiving the emails from this account, but all messages in it still keeps as it is.

1. Enter main menu screen, and tap Email to enter account screen.
2. Tap  > Settings.
3. Choose the desired Email account from the account list.
4. Choose "Remove account" to delete it.

10.2 Browser

10.2.1 Open browser

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

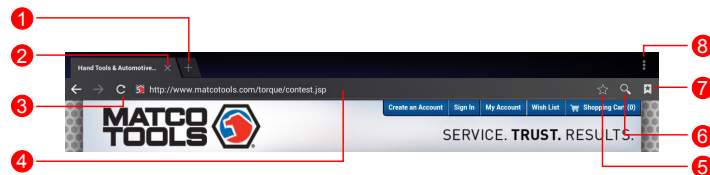


Fig. 10-1

- | | |
|---|-----------------------------------|
| 1 | Create a new tab. |
| 2 | Close the current page. |
| 3 | Refresh the current page. |
| 4 | Input a web address. |
| 5 | Add the current page as bookmark. |
| 6 | Open search bar. |
| 7 | Open bookmark list. |
| 8 | View more options. |

10.2.2 Download files

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

For example:

Tap and press a picture, then choose "Save image" from pop-up menu to download it.

To download a link, tap and press it, and then choose "Save link".

To protect your X-431 PADII and personal data, please download applications from trusted sources. To configure it, tap Settings > Security, and then deselect the box next to Unknown sources.

10.2.3 Manage bookmarks

You can set the favorite website as bookmark for your quick access.

1. Enter main menu screen, tap **Browser** to launch the browser.
2. Tap  to enter bookmarks page.
3. Long press it, you can share, open and delete the bookmark.

10.2.4 Set homepage

This option enables you to set commonly visited website as the homepage. The homepage will be opened by default every time you launch your browser.

1. Enter main menu screen, tap **Browser** to launch the browser.
2. Tap  > Settings > General.
3. Tap "Set homepage", then follow the on-screen instructions to finish it.

10.2.5 Clear history

To prevent your personal information from being exposed much better, you are strongly recommended to clear your browser navigation

history.

1. Enter main menu screen, tap **Browser** to launch the browser.
2. Tap  > Settings > Privacy & security.
3. Tap "Clear history".

10.3 Using Bluetooth

Bluetooth connection is supported on X-431 PADII. Using it, you can connect X-431 PADII to other compatible devices for data transmission.

 *Note: Bluetooth connection is likely to be disturbed by other objects, such as walls or other electronic devices.*

10.3.1 Open Bluetooth

1. Enter main menu screen, tap "Settings" --> "Bluetooth".
2. When the Bluetooth switch is ON position, it indicates it is already on and a corresponding Bluetooth icon will appear on the status bar of X-431 PADII.

10.3.2 Allow other devices to search for X-431 PADII

1. Enter main menu screen, tap "Settings" --> "Bluetooth". Tap  and choose "Visibility timeout".
2. Set the desired visibility option.

10.3.3 Search other devices and pair X-431 PADII with it

Before transmitting data with other Bluetooth devices, you have to pair X-431 PADII with it.

1. Check and ensure Bluetooth is ON.
2. Enter main menu screen, tap "Settings" --> "Bluetooth".
3. X-431 PADII starts scanning all Bluetooth devices.

4. Choose the desired one from the search result to pair it with X-431 PADII.

10.3.4 Send file via Bluetooth

You can send pictures, videos, audio files or test reports to others for sharing and review via Bluetooth.

To transfer files via Bluetooth, please proceed with the following steps described below:

1. Enter main menu screen, and tap "File Manager".
2. Access the corresponding folder and choose the desired picture, video or audio file.
3. Tap  and choose "Bluetooth" from the pull-down menu.
4. Tap the target Bluetooth device you want to transmit files.

10.4 Camera

10.4.1 How to take a picture

Enter main menu screen, tap **Camera**.



Fig. 10-2

1	Drag the slider to toggle between camera and video mode.
2	Tap it to take a picture.
3	Tap it to browse your pictures.
4	To zoom in, place two fingers on the focus area and then spread them apart; To zoom out, place two fingers apart and then pinch them together.
5	Set camera parameters, such as Exposure, White balance, Picture size etc.
6	Tap it to select color effect.
7	Tap it to turn on/off flash mode.
8	Tap to toggle between front camera and rear camera.

10.4.2 How to record a video

In camera mode, drag the slider to video mode.

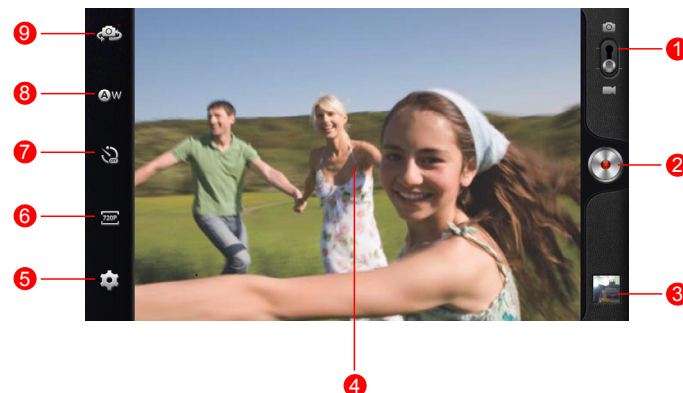


Fig. 10-3

1	Drag the slider to toggle between camera and video mode.
2	Tap it to start recording a video.
3	Tap it to play back your video.
4	To zoom in, place two fingers on the focus area and then spread them apart; To zoom out, place two fingers apart and then pinch them together.
5	Tap it to make some video settings, including Fix time, Exposure, Save location etc.
6	Tap it to choose video size.
7	Tap it to set time lapse interval.
8	Tap it to set white balance.
9	Tap to toggle between front camera and rear camera.

10.5 Gallery

This option is used to manage pictures and video files.

10.5.1 Open gallery

Enter the main menu screen, tap **Gallery** to open gallery, the system starts scanning all pictures and videos on X-431 PADII.

10.5.2 View pictures or videos

1. Enter the main menu screen, tap **Gallery** to open gallery.
2. Tap a picture or video file to view it in full screen mode. Swipe the screen to right or left to view the previous or next one.

To zoom in manually, place two fingers on the screen and then spread them apart. To zoom out, either double-tap again or place two fingers apart on the screen and then pinch them together.

Featuring gravity sensor, X-431 PADII will adjust the orientation of the pictures automatically if it is rotated.

The following operations can be also done while browsing gallery:

	To play back pictures in the current folder.
	To launch camera.
	To share pictures or videos.
	To view more options.

10.5.3 Edit photos

Without installing third-party photo processing software, X-431 PADII provides powerful photo editing functions, such as light compensation,

red eye processing, crops etc.

1. Open the picture to be edited in **Gallery**.
2. Tap the icons located on the bottom of the picture to perform the corresponding functions.
3. Tap Save, the edited picture will also be saved in the same folder in which the original picture lies.

10.6 Music

Enter main menu screen, and tap **Music** to enter. Music files are stored into 4 categories: Artists, Albums, Folders and Playlist.

1. Tap the desired music type. Open music file list.
2. Tap the desired audio files to start playing.

10.7 Calendar

This function lets you view calendar or create to-do events.

Enter main menu screen, tap **Calendar**. Tap the time in the upper left corner to switch between Day, Week, Month and Agenda.

10.8 Alarms

10.8.1 Add an alarm

1. Enter main menu screen, tap **Music**.
2. Tap **+** to enter new alarm setting interface.
3. Set the detailed items.
4. After setting, tap "OK" to confirm.

10.8.2 Delete an alarm

1. On alarm list screen, tap and hold the desired alarm.

2. Tap the , and then tap “OK” in the confirmation dialog box to delete it.

10.8.3 Turn on/off alarm

On alarm list screen, slide the switch to ON to activate it. To disable it, just switch it to OFF.

10.9 File Manager

This option enables you to manage your files.

Tap **File Manager**, and then choose the desired folder to perform corresponding operations.

10.10 Applications

10.10.1 Install applications

To install an application, you need to download it firstly. All items downloaded in default browser are saved in **Downloads**.

1. On the main menu screen, tap **Downloads**.
2. Choose the desired .apk file.
3. Tap “Install” to start installing the application.
4. Tap “Done” to finish it.

 **Note:** In process of installation, a message prompting installation prohibited may appear. Please read it carefully. To install it, please tap “Settings” > “Security”, and check the box next to “Unknown sources”, which allows you to install non-Market application.

10.10.2 View installed applications

1. Tap Settings > Apps.

2. Swipe the screen from right to left until ALL tab appears.
3. Tap the desired one to view its detailed information.

10.10.3 Uninstall applications

To release storage space, you can uninstall some unused applications.

1. Tap Settings > Apps.
2. Swipe the screen from right to left until ALL tab appears.
3. Tap the desired one to enter.
4. Tap “Uninstall” and then tap “OK” in the dialog box to start uninstalling.

10.11 Set Date & Time

X-431 PADII is preset to use the network-provided date, time zone and time.

 **Note:** If Automatic date & time is set as Use network-provided time, date, time and time zone will not be defined.

1. Enter the main menu screen, tap Settings > “Date & time”.
2. Deselect “Automatic date & time”.
3. Follow the on-screen instructions to set date, time and time zone.

10.12 Clear Cache

Doing so will clear all browsing records and accounts and enables X-431 PADII 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 spare the space these cache files are occupied.

Appendix - FAQ

1. Whether can I use other similar adaptors to charge X-431 PADII?.

No. Please use the included 5V power adaptor or docking station to charge your X-431 PADII. We assume no responsibility for damage or loss resulting from using other similar adaptors other than the specified one.

2. How to save power?

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

3. What should I do in case I forgot the screen lock?

You can set screen lock as pattern or password. If you forgot the password, please consult your device provider or reset your device.

In light that you often use X-431 PADII to diagnose vehicles and it may take you several minutes to do resetting, you are not recommended to define screen lock.

For detailed information on how to restore X-431 PADII to factory settings, please refer to Item 4 "How to reset X-431 PADII tablet?" described as below.

4. How to reset X-431 PADII tablet?

Do the followings to reset X-431 PADII:

1. Ensure X-431 PADII is in OFF mode;

2. Hold and press VOLUME - key and POWER key until X-431 PADII enters system recovery mode;
3. Use the VOLUME + / VOLUME - key to move the highlight bar on "wipe data / factory reset" and press POWER key to confirm;
4. Press VOLUME + / VOLUME - to select "yes" and press POWER key to confirm;
5. Select "reboot system now" and press POWER key to restart the system;
6. After resetting is complete, follow the on-screen instructions to finish the system settings.

 **Warning:** Resetting may cause data loss. Before doing so, please make sure important data has been backed up.

5. How to do if the system runs slowly?

In this case, please do the followings:

- > Check all running applications ("Settings" > "Apps" > Swipe the screen from right to left until "RUNNING" tab appears) and stop the unused applications (Tap the desired application, and then tap "Stop").
- > Check all installed applications and remove the unnecessary applications.

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

6. Why some videos on the website can be not played?

It possibly results from:

1. The current browser does not support Flash playing;
2. Flash player does not support this video.

Try to use other browsers to watch it or install other Flash player.



7. The data and time of X-431 PADII can not be set.

It is because Automatic date & time is set on your X-431 PADII. Tap Settings > Date & time, deselect "Automatic date & time" and then set the date and time manually.

The exposure standard for wireless devices employs a unit of measurement known as the Specific Absorption Rate(SAR). The SAR limit set by the FCC is 1.6 W/kg. The highest SAR level measured for this device is less than SAR limit, so this device meets the FCC Requirement.

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

Any question during the operation, please call 86-755-89366558.

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: Customer Service Department

LAUNCH TECH. CO., LTD.

Launch Industrial Park,

North of Wuhe Avenue,

Banxuegang, Bantian,

Longgang, Shenzhen, Guangdong

P.R.China, 518129

Launch website: <http://www.cnlaunch.com>

<http://www.golo365.com>

Statement:

LAUNCH reserves the rights to make any change to product designs and specifications without notice. The actual object may differ a little from the descriptions in the manual in physical appearance, color and configuration. We have tried our best to make the descriptions and illustrations in the manual as accurate as possible, and defects are inevitable, if you have any question, please contact local dealer or after-sale service center of LAUNCH, LAUNCH does not bear any responsibility arising from misunderstandings.