Optimized Diesel Diagnostics for U.S. Heavy-Duty Trucks

Vehicle Inspection Precautions

- It must be operated in accordance with the safety regulations of the truck repair industry. Pay special attention to the influence or damage caused by environmental factors such as acid and alkali, poison gas and high pressure and heavy objects;
- Sulphuric acid is contained in automobile battery liquid. Sulphuric acid is corrosive to skin. When operating, direct contact between battery liquid and skin should be avoided. Special attention should be paid to not splashing into eyes and no fire near;
- There are many toxic compounds in the exhaust gas of the engine. Avoid inhalation. Park the vehicle in a well-ventilated place during operation;
- When the engine is running at a high temperature, avoid contact with high temperature parts such as water tanks and exhaust pipes;
- Before starting the engine, the brake hand brake should be pulled, and the shift lever should be placed in neutral (manual transmission) or P-range (automatic transmission) to avoid accidents when the vehicle is started;
- Before the vehicle is repaired, pull the parking brake, the transmission gear is hung in the neutral or P gear, and lower the driver's seat side glass door and window;
- If the engine can start, warm the car to normal temperature (water temperature is about 80 °C), and turn off the auxiliary appliances (such as air conditioning, lighting, sound, etc.);
- Locate the car diagnostics and check that the diagnostics line is intact and connect to the Tablet for diagnosis. Otherwise, it is not necessary to test to avoid damage to the Tablet. If necessary, measure the voltage of the diagnostic socket with a multimeter;

Instrument use precautions

- When testing with the product, it is necessary to handle them lightly, keep away from heat source and

electromagnetic field, avoid interference to the main machine;

- You can't click on touch screen with sharp tools. It is recommended to use matching touch pen operation;
- When the electrical components are energized, the circuit cannot be disconnected to prevent self-inductance and mutual inductance current from damaging the sensor and the vehicle ECU;
- When the appliance is working normally, it is strictly forbidden to bring the magnetic object close to the vehicle control unit, otherwise the vehicle control unit may be damaged;
- When disassembling the car control unit or electrical components, the ignition switch must be turned off for 1 minute;
- Never operate the diagnostic equipment while driving the vehicle to avoid accidents.

UL4200A Compliance and Use Precautions

⚠ WARNING

- **INGESTION HAZARD**:This product contains a button cell or coin battery.
- **DEATH** or serious injury can occur if ingested.
- **A** swallowed button cell or coin battery can cause **Internal Chemical Burns** in as little as **2 hours**
- **KEEP** new and used batteries **OUT OF REACH of CHILDREN**
- **Seek immediate medical attention** if a battery is suspected to be swallowed or inserted inside any part of the body.

⚠ WARNING

- **INGESTION HAZARD**: This product contains a button cell or coin battery.
- **DEATH** or serious injury can occur if ingested.
- A swallowed button cell or coin battery can cause **Internal Chemical Burns** in as little as **2 hours**.
- **KEEP** new and used batteries **OUT OF REACH of CHILDREN**
- **Seek immediate medical attention** if a battery is suspected to be swallowed or inserted inside any part of the body.

1) Remove and immediately recycle or dispose of used batteries according to local regulations and keep away from children. Do NOT dispose of batteries in household trash or incinerate.

2) Even used batteries may cause severe injury or death.

3) Call a local poison control center for treatment information.

4) The compatible battery type is CR2032.

5) The nominal battery voltage is 3V.

6) Non-rechargeable batteries are not to be recharged.

7) Do not force discharge, recharge, disassemble, heat above (manufacturer's specified temperature rating) or incinerate. Doing so may result in injury due to venting, leakage or explosion resulting in chemical burns.

8) Ensure the batteries are installed correctly according to polarity (+ and -).

9) Do not mix old and new batteries, different brands or types of batteries, such as alkaline, carbon-zinc, or rechargeable batteries.

10) Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time according to local regulations.

11) Always completely secure the battery compartment. If the battery compartment does not close securely, stop using the product, remove the batteries, and keep them away from children.

FCC Compliance

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.

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

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference,
- this device must accept any interference received, including interference that may cause undesired operation.

In addition, this device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

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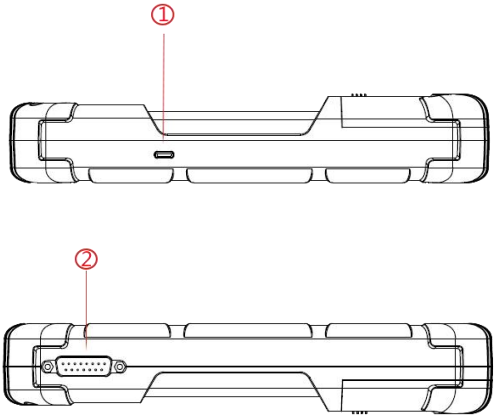
1. PRODUCT OVERVIEW

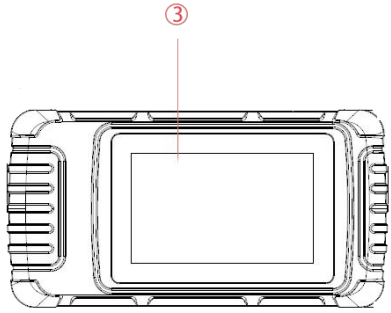
The product is the professional grade code scanners for the Commercial Vehicle market. It covers light, medium and heavy duty vehicles, for reading & clearing codes, live data, DPF regeneration.

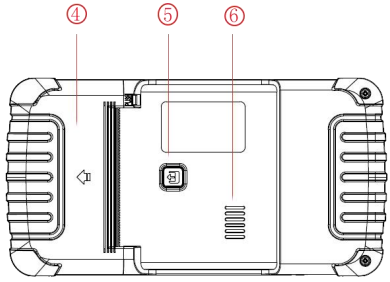
This product integrates commercial vehicle OBD standard diagnostic protocols, including SAE J1939, SAE J1708, SAE J1850 PWM, SAE J1850 VPW, ISO 14230-4, ISO 9141-2, ISO 15765-4 and ISO 27145-4. The commercial vehicles are classified according to the vehicle type, and the operation interface is very clear, which makes it convenient for users to diagnose commercial vehicles.

A built-in printer module is also available to print diagnostic data and reports. At the same time, the product supports online upgrade of diagnostic program and diagnostic data.

1.1 PRODUCT STRUCTURE







Serial No.	Name	Function Description
①	USB Port	Used to connect to an external computer
②	DB-15 Interface	Used to connect to the vehicle or the power adapter
③	Touch Screen	Display content and touch operation area
④	Paper socket	Printer paper socket
⑤	Printing Test key	Printer self-testing
⑥	Speaker	Device sound output

1.2 HOST CONFIGURATION

CPU	Quad-Core ARM Cortex-A7
RAM	1GB
Flash	8GB
Display	5 inches LCD，resolution ratio 800*480
TP touch screen	Capacitive screen
WIFI	802.11b/g/n 2.4GHz
Horn	Support
USB interface	Type C interface
Diagnose interface	DB15 interface
Operating voltage	DC 10V~24V/3A
Operating temperature	-10℃~50℃
Storage temperature	-20℃~60℃

1.3 PRINTER CONFIGURATION

Printer	80mm thermal printer
Print speed	60mm/s
Effective print width	72mm
Print resolution	203dpi 1mm=8dots
Print paper specifications	80mm*30mm

2. POWER ON /OFF

The device is provided with a main diagnostic test line, which has three interfaces: DB-15 interface, OBD interface and DC power interface. The line can transmit data as well as electricity.

2.1 POWER SUPPLY

The device can be powered on in the following ways:

- **Powered on by the Vehicle**:

Connect one end of the main diagnostic test line to the DB-15 interface of the device, and the other end to the OBD interface of the vehicle, then the device will turn on automatically. If the device fails to power on, there may be no power supplied to the vehicle's diagnostic port, in which case, the device can be powered by either the cigarette lighter or battery clamp.

- **Powered on by the power adapter**:

Connect one end of the main diagnostic test line to the DB-15 interface of the device, and the other end to the DC power interface of the power adapter, the device should then start up automatically.

Note: The voltage of the power supply should be within the scope of the product. Exceeding the range may cause damage to the product.

2.2 POWER OFF

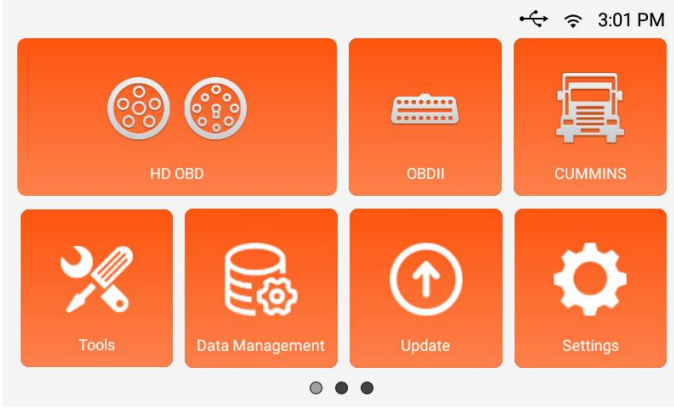
Before powering off, please stop all diagnostic procedures and return back to the main interface.

Disconnect the diagnostic main test line from the OBD interface of the vehicle. The device is not equipped with a battery; the device will shut down automatically after disconnecting the main

test line from the OBD interface of the vehicle.

3. INTRODUCTION TO EACH FUNCTION MENU

After the system is powered on, enter the function main menu, as shown in the figure:



1) Toolbar (see Table 1)

2) Function sub menu (see Table 2)

3) Function main menu (see Table 3)

Table 1: Toolbar

Icon	Function name	Function description
	Refresh	Refresh upgrade menu
	Home	Return to the main interface
	Screenshot	Capture current screen picture
	Test report	Used to save test data (can be viewed in data management menu)
	Feedback	Used to report the problem to the company's service system when the system cannot be accessed
	Print	Used to print test results or test reports.
	Edit	Used to edit , lock, unlock or delete files
	Added	Used to add feedback information
	Exit edit mode	Exit the edit mode of files
	Select All	Select all files on the current page
	Lock	Lock files to avoid files being deleted
	Unlock	Unlock files
	Delete	Delete files

Table 2: Function sub menu

Icon	Function name	Function description
	Pin detecting	Measures the voltage of 16 PIN of OBD diagnostic interface, and judges the pin position of K- line and CAN line.
	Report	Browse and manage the test report files
	Screenshot	Browse the screenshot files
	Feedback	Create or manage the feedback files
	WIFI	Set the WIFI network
	Brightness	Used to adjust the brightness of the device screen
	Volume	Adjust the volume of the device
	User info	View device status and user information
	Storage	Manage the storage, such as removing useless data from the device
	General	Used to set device language, unit and time, view device information and restore factory settings

Table 3: Function main menu

Icon	Function name	Function description
	Diesel OBD	Diagnostic procedure: Diesel OBD
	OBD-II	Diagnostic procedure: OBD-II
	Model	Diagnostic procedure: a specific model
	Tools	(Pin Detect)For the measurement of pin voltage of diagnostic interface
	Data management	For browsing and managing saved data files
	Update	For online upgrade of system software and vehicle software, see section 8 for details
	Settings	Set and view system information, see section 9 for details

4. VEHICLE DIAGNOSTIC PREPARATION

The diagnostic program establishes a data connection through the vehicle's electronic control system that has been connected with the equipment, which can read the vehicle diagnostic information, view data stream, and perform action tests such as forced DPF regeneration and ash/soot ratio reset.

- To establish good communication between the diagnostic program and the truck, you need to perform the following operations:

1) Turn on the ignition;

2) Determine the location and interface of the truck's diagnostic port; It is usually located on the driver side; If the OBD interface was not found, please refer to the vehicle maintenance manual.

3) Connect one end of the main test lead to the DB-15 connector of the device and tighten the fixing bolts. The other end is connected to the OBD-II connector.

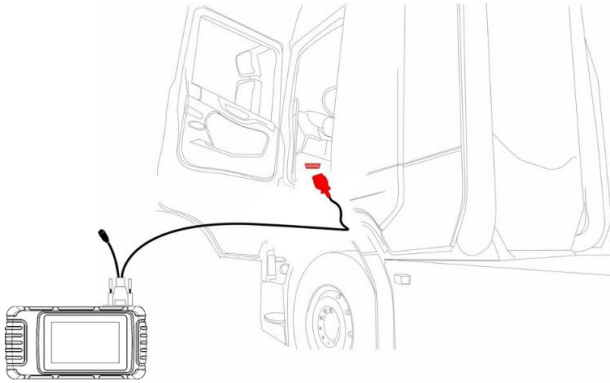
Note: Before connecting to the truck, it is necessary to judge whether the diagnostic port of the vehicle is a standard OBD-II interface or non-standard OBD-II interface.

- A truck compatible with OBD-II management system can be connected to the diagnostic main cable and powered by a standard OBD-II;
- Trucks that are not compatible with the OBD-II management system need to select the corresponding connector; some trucks need to supply power by other power sources.

Here are the instructions for the two connection methods.

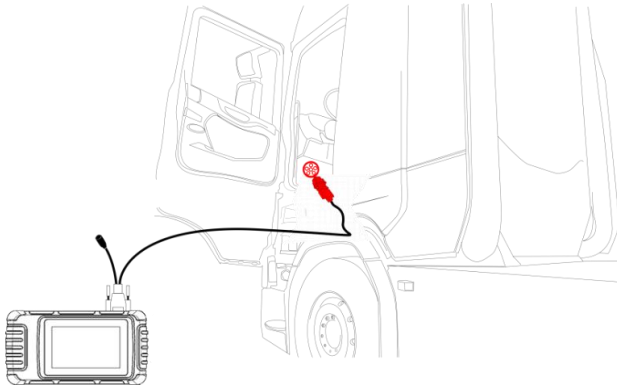
1) Connection of standard OBD-II interface

A truck connected with standard OBD-II interface need only a standard main cable to connect, no need to connect with other connectors, as shown in the Figure:



2) Connection of non OBD-II interface

For trucks connected to non OBD-II interface, need to connect the main test cable to their corresponding dedicated connector, as shown in the figure:



Note: at this time, the equipment is powered by the truck diagnostic port, and the device starts up automatically. If not, it may be that there is no power supplied on the diagnostic port, in which case the equipment should be powered by the cigarette lighter or battery clip.

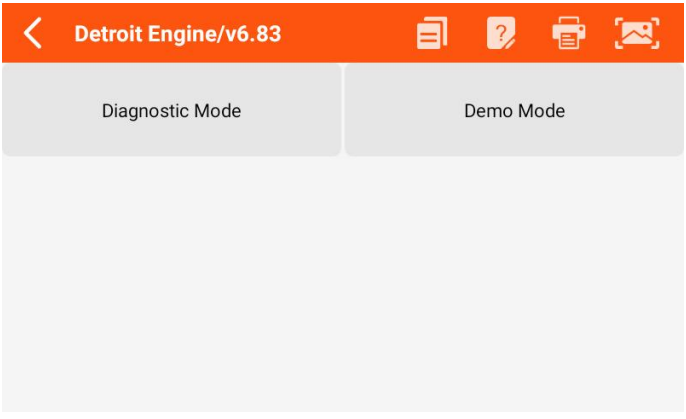
5. DIAGNOSIS

Take the model 【DETROIT】as an example.

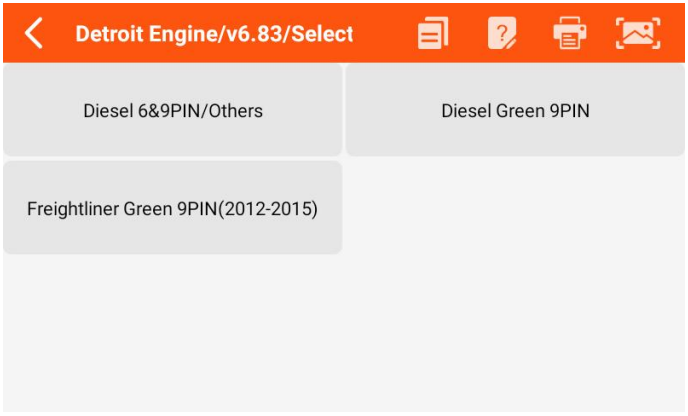
1) Select 【DETROIT】menu enter the diagnosis interface;

2) Select the 【Diagnostic Mode】;

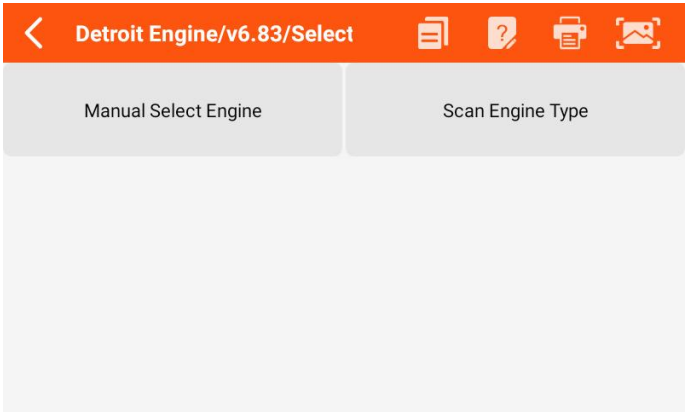
Note: The【Demo Mode】just gives a demonstration for users.



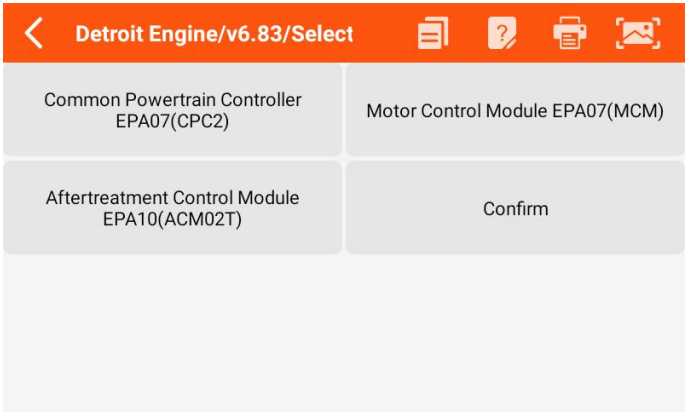
3) Select connector according to the specific situation, such as 【Diesel6&9PIN/Others】;



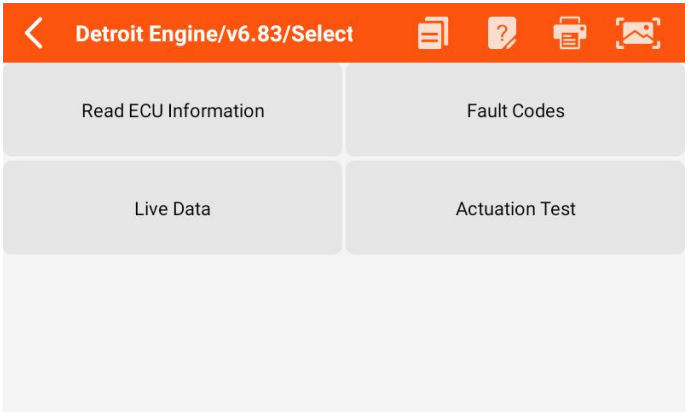
4) Select the engine (two ways: scan automatically or select manually), such as 【Scan Engine Type】;



5) The system lists the information of all modules, click 【Confirm】;



6) Enter【Diagnosis home page】;



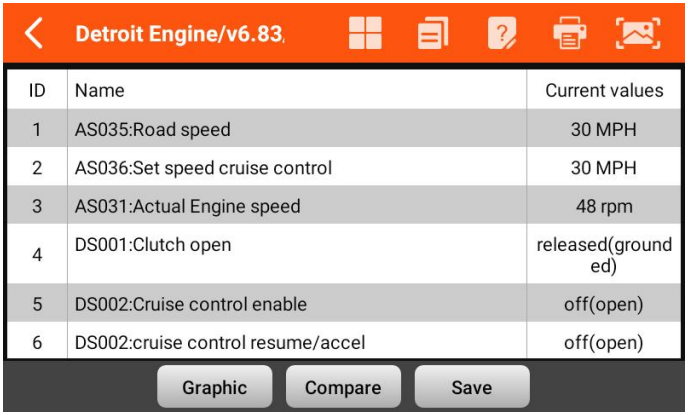
The main diagnostic interface usually includes the following options:

1) **Read ECU Information:** Read and display the control system module information detected from ECU

2) **Fault Codes:**

- **Read Fault Code:** Read the fault code information retrieved from the vehicle system module
- **Erase Fault Code:** Clear the fault code and freeze frame data retrieved from the vehicle system module

3) **Live Data**: Read and display the current system module real-time running parameters, this option may sometimes display as “real-time data”.



ID	Name	Current values
1	AS035:Road speed	30 MPH
2	AS036:Set speed cruise control	30 MPH
3	AS031:Actual Engine speed	48 rpm
4	DS001:Clutch open	released(grounded)
5	DS002:Cruise control enable	off(open)
6	DS002:cruise control resume/accel	off(open)

Graphic Compare Save

- **Graphic**: View the real-time running parameters of the unit in the data stream waveform graph mode, and select [List] to return to the numerical display state.
- **Compare**: Compare the data steam. Select a saved data file of the same vehicle type in the pop-up dialog box, and select [OK] to return, and then an additional column "CMPR values" in the data stream interface. Click [Stop] to stop comparation.
- **Save**: Save the current data stream (for subsequent data stream comparison)

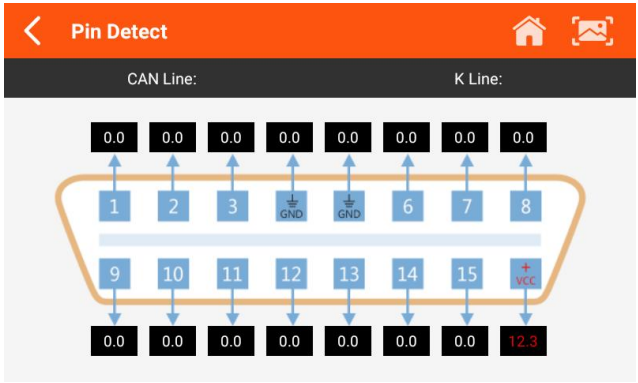
4) **Actuation Test:** By executing this function, you can access the specific subsystems of the vehicle and perform component tests. When the action test is performed, the diagnostic instrument inputs instructions to the ECU to drive the actuators, and judges whether the actuators of the vehicle's electronic control system and their circuits are normal. This product mainly provides DPF system test, and

different control systems of different models have different executable test options, please refer to the screen display.

6. PIN DETECT

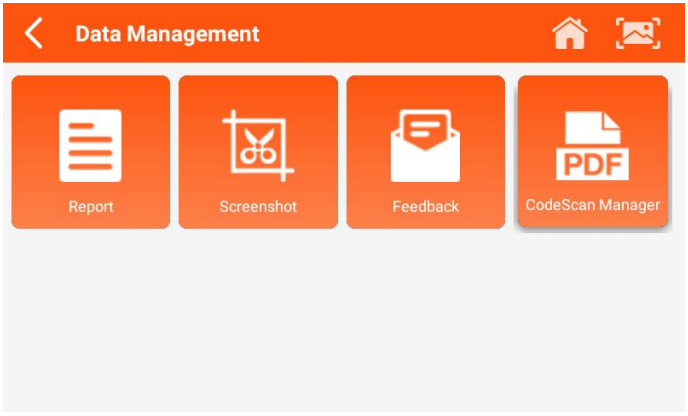
This function mainly measures the voltage of 16 PIN of OBD diagnostic port, and judges the pin position of K- line and CAN line.

After connecting the OBD of the truck, select "PIN Detect" under the menu【Tools】. The program automatically measures the voltage of each pin the diagnostic port, and judges the pin position of K-line and CAN line, as shown in the figure below:



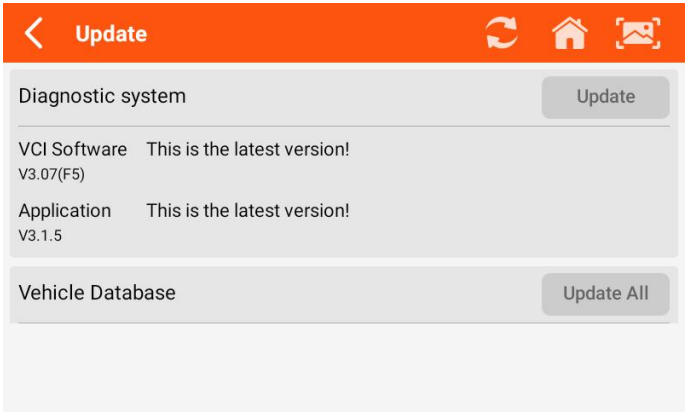
7. DATA MANAGEMENT

【Data Management】The function is used to save , view ,report saved files. Most of the files are generated by the toolbar operation of the vehicle diagnosis interface.



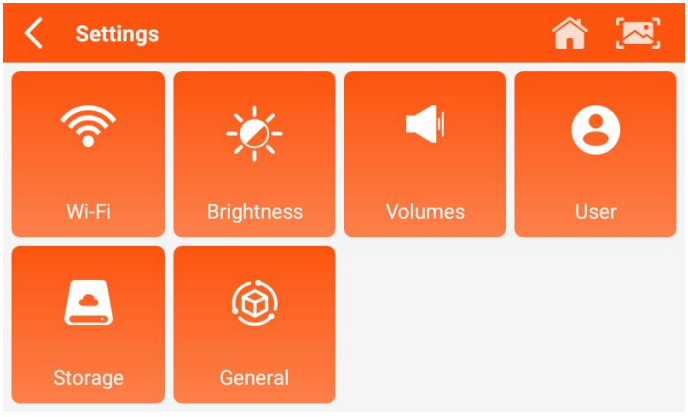
8. UPGRADE

By connecting the device to a wireless network ,open 【Update】 in the function main menu, and the system will automatically search for the latest update program, as shown in the figure below. Click 【Update】 to upgrade the model and other applications to the latest version.



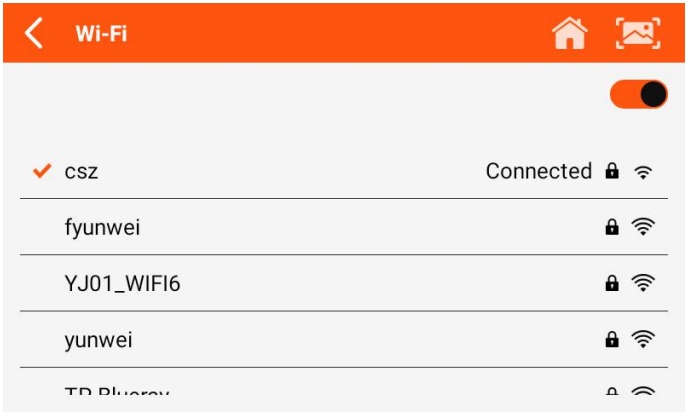
9. SETTINGS

In the function main menu , select 【Settings】 from the main menu to open the setting interface, where you can adjust the following system settings:



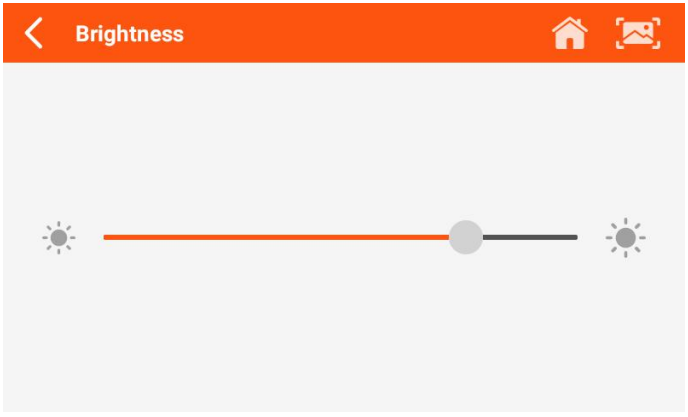
9.1 WIFI CONNECTION

The device supports wireless network connection for diagnostic software upgrade and problem feedback.



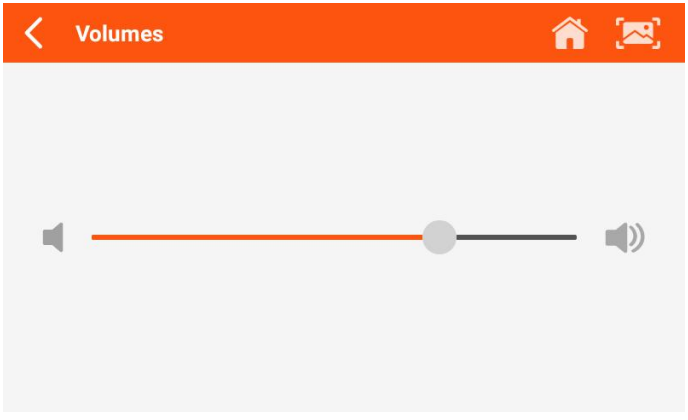
9.2 BRIGHTNESS

The device supports screen brightness setting, please adjust it according to your preference.



9.3 VOLUMES

The device supports volume adjustment.



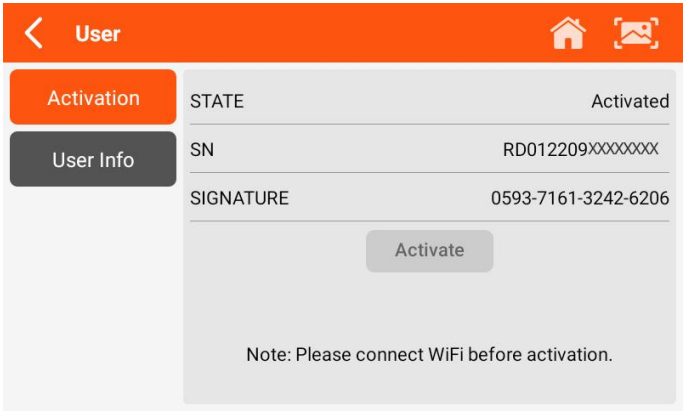
9.4 USER

1) Activation

The products are activated several times at the factory. When you turn on the phone, you will be prompted: “You are using the trial version, you have**chances to use".

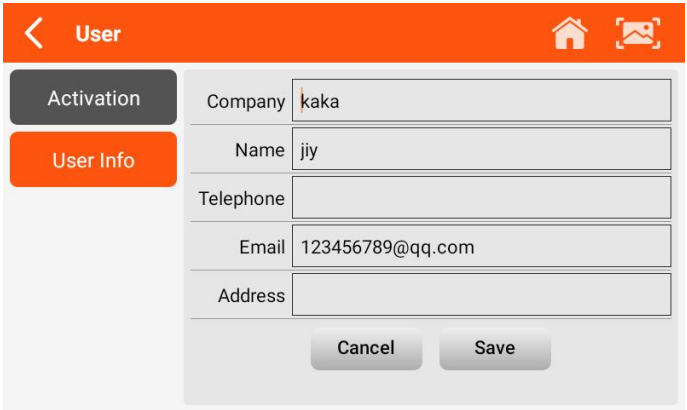
Connect to the network to enter the settings, click [Activation], the machine can be activated.

Note: Please ensure that the device is connected to an effective Wi-Fi before performing the activation operation.



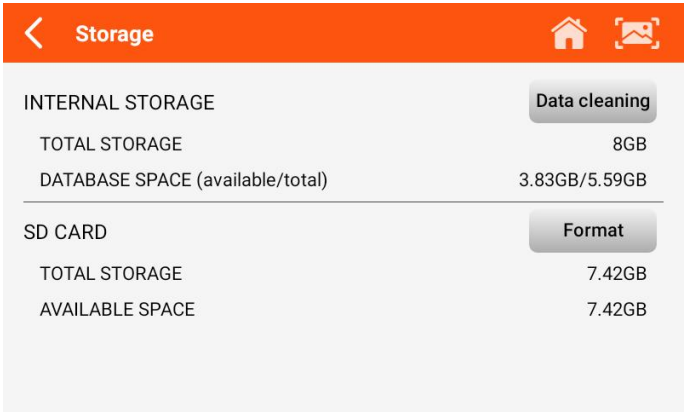
2) User Info

Set your personal information: name, telephone, email, address, etc.



9.5 STORAGE

Cleaning up useless data with one click, freeing up more space and cleaning up regularly will help the system run more stable.



9.6 GENERAL

Set the general information or look up the device information.

1) Language

Please select settings based on the language you support for the model you purchased.

2) Unit

This option is used to set the data flow unit in the diagnostic equipment software. Please select metric system or English system as required.

3) Date &Time

This option is used to set the date / time of the device. The default is automatic network synchronization update, or it can be set manually.

4) About

This option is used to lookup the device model, version, serial number, etc.

5) Reset

This option is used to restore the original settings of the device, which will delete all the data stored in the device, including the activation information and model data. You need to re-connect to the network to activate and download the model data package.

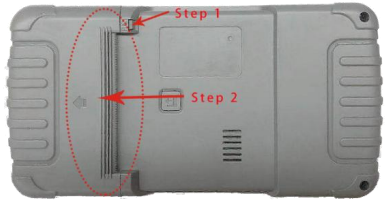
10. PRINTER INTRODUCTION

10.1 PRINTER LOADING OR CHANGING PAPER

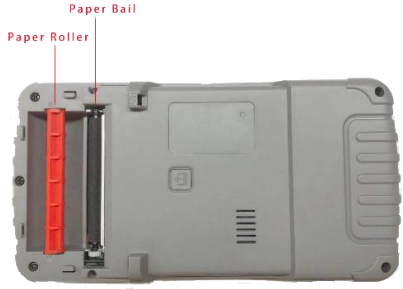
1) Open the paper bin cover by the following two steps.

   Step 1: Push the snap-fit according to the arrow direction.

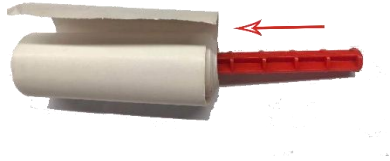
   Step 2: Draw the cover out toward the left.



2) Take out the paper roller upward first, and then the paper bail.



3) Insert the roller into the print paper.



4) Put the paper into the socket first, and draw a part of paper, then put the paper bail on the paper and clip it into the socket.

Note: Pay attention to the direction of the paper. If the installation is reversed, the printing will be invalid.

5) Close the cover.

10.2 PRINTER SELF TEST FUNCTION

1) When the machine is turned on, press the printer test key briefly, and the printer will automatically print out a piece of blank paper.

2) In the case of power on, long press the printer test key for three seconds, the printer will automatically print a section of self-test content, indicating that the printer function is normal.

Certification

This product has been strictly inspected as qualified products and met the company standards.

Product name	HD Truck DPF Regen Scanner
Product serial number	
Date of production	
Inspector	

Warranty card

Product name	HD Truck DPF Regen Scanner
Product serial number	
Purchase date	

Company name: _____

User address: _____

Contact person: _____

Contact number: _____