NEXAS Scanner Check Engine Light User Manual

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NEXAS Scanner Check Engine Light User Manual

NexLink NL101

www.nexastech.com

Disclaimer

All information, illustrations, and specifications contained in this manual are based on the latest information available at the time of publication. The right is reserved to make change at any time without notice.

Safety Precautions and Warnings

To prevent personal injury or damage to vehicles and/or the NL101, please read this user's manual first carefully and observe the following safety precautions at a minimum whenever working on a vehicle:

- Always perform automotive testing in a safe environment.
- Do not attempt to operate or observe the tool while driving a vehicle. Operating or observing the tool will cause driver distraction and could cause a fatal accident.
- Wear safety eye protection that meets ANSI standards.
- Keep clothing, hair, hands, tools, test equipment, etc. away from all moving or hot engine parts.
- Operate the vehicle in a well-ventilated work area: Exhaust gases are poisonous.
- Put blocks in front of the drive wheels and never leave the vehicle unattended while running tests.
- Use extreme caution when working around the ignition coil, distributor cap, ignition wires and spark plugs.
- These components create hazardous voltages when the engine is running.
- Put the transmission in P (for A/T) or N (for M/T) and make sure the parking brake is engaged.
- Keep a fire extinguisher suitable for gasoline/chemical/ electrical fires nearby.
- Don't connect or disconnect any test equipment while the ignition is on or the engine is running.
- Keep the NL101 dry, clean, free from oil/water or grease. Use a mild detergent on a clean cloth to clean the outside of the NL101, when necessary.

1. INTRODUCTION

The NL101 is specially developed for car, min van and light vehicles, which supports all 10 modes of OBDII test (EVAP, O2 Sensor, I/M Readiness, MIL Status, VIN Info, and On-board monitors testing etc.) for a complete diagnosis and enables users to read DTCs, clear DTCs and view the live engine data stream with a live color graphing. It covers a wide range of vehicles since it offers multiple data bus protocols, such as CAN, J1850 PWM, J1850 VPW, ISO9141 and KWP2000. As an unique feature while other OBD scanner dose not have, NL101 could quickly check the vehicle's battery health, read out the current battery value and give out 6 levels of battery warnings for your knowledge. It can be connected to PC through the USB cable for upgrade to keep updated with the latest software version.

Notice: NL101 may automatically reset while being disturbed by strong static electricity. THIS IS A NORMAL REACTION.

2. General Information

2.1 On-Board Diagnostics (OBD) II

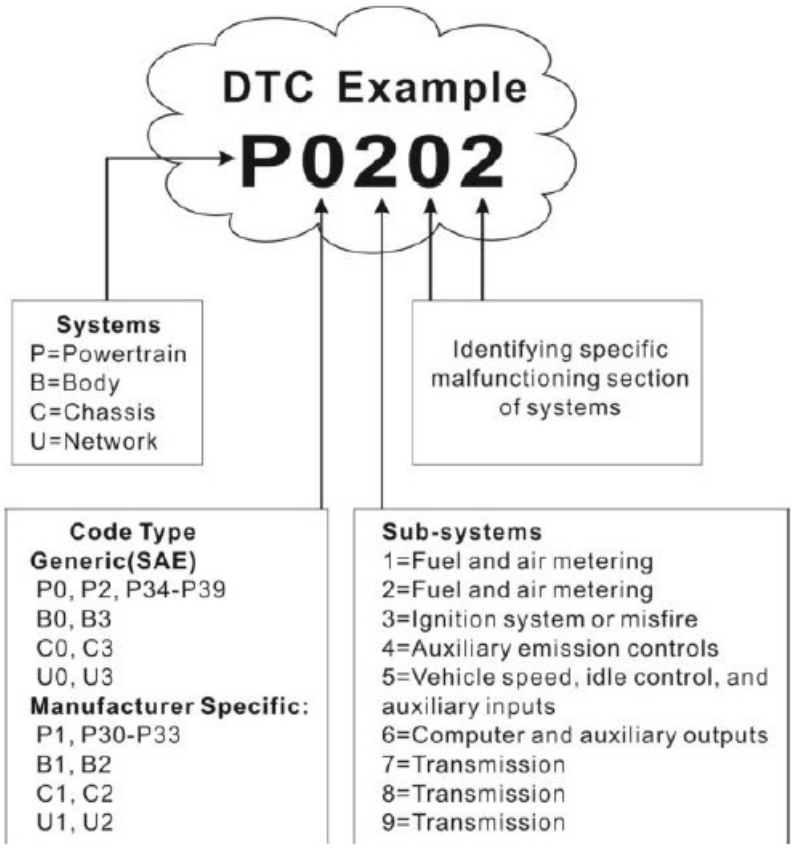
The first generation of On-Board Diagnostics (called OBD I) was developed by the California Air Resources Board (ARB) and implemented in 1988 to monitor some of the emission control components on vehicles. As technology evolved and the desire to improve the On-Board Diagnostic system increased, a new generation of On-Board Diagnostic system was developed. This second generation of On-Board Diagnostic regulations is called "OBD II".

The OBD II system is designed to monitor emission control systems and key engine components by performing either continuous or periodic tests of specific components and vehicle conditions. When a problem is detected, the OBD II system turns on a warning lamp (MIL) on the vehicle instrument panel to alert the driver typically by the phrase of "Check Engine" or "Service Engine Soon". The system will also store important information about the detected malfunction so that a technician can accurately find and fix the problem. Here below follow three pieces of such valuable information:

1. Whether the Malfunction Indicator Light (MIL) is commanded 'on' or 'off';
2. Which, if any, Diagnostic Trouble Codes (DTCs) are stored;
3. Readiness Monitor status.

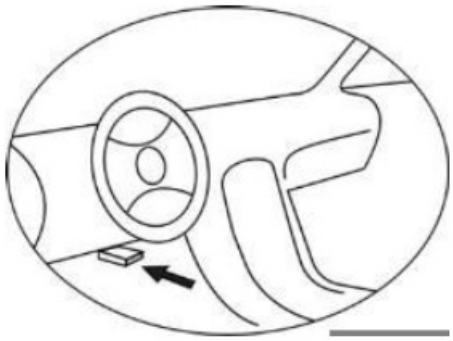
2.2 Diagnostic Trouble Codes (DTCs)

Diagnostic Trouble Codes (DTC) are codes that are stored by the on-board computer diagnostic system in response to a problem found in the vehicle. These codes identify a particular problem area and are intended to provide you with a guide as to where a fault might be occurring within a vehicle. OBD II Diagnostic Trouble Codes consist of a five-digit alphanumeric code. The first character, a letter, identifies which control system sets the code. The second character, a number, 0-3; other three characters, a hex character, 0-9 or A-F provide additional information on where the DTC originated and the operating conditions that caused it to set. Here below is an example to illustrate the structure of the digits:



2.3 Location of the Data Link Connector (DLC)

The DLC (Data Link Connector) is the standardized 16-cavity connector where diagnostic scan tools 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 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 service manual for the location.



2.4 OBD II Monitor Readiness Status

OBD II systems must indicate whether or not the vehicle PCM monitor system has completed testing on each component. Components that have been tested will be reported as Ready, or Complete, meaning they have been tested by the OBD II system. The purpose of recording readiness status is to allow inspectors to determine if the vehicle OBD II system has tested all the components and/or systems. The power-train control module (PCM) sets a monitor to Ready or Complete after an appropriate drive cycle has been performed. The 5 drive cycle that enables a monitor and sets readiness codes to Ready varies for each individual monitor. Once a monitor is set as Ready or Complete, it will remain in this state. A number of factors, including erasing of diagnostic trouble codes (DTCs) with a scan tool or a disconnected battery, can result in Readiness Monitors being set to Not Ready.Since

the three continuous monitors are constantly evaluating, they will be reported as Ready all of the time. If testing of a particular supported non-continuous monitor has not been completed, the monitor status will be reported as Not Complete or Not Ready. In order for the OBD monitor system to become ready, the vehicle should be driven under a variety of normal operating conditions. These conditions may include a mix of highway driving and stop and go, city type driving, and at least one overnight-off period. For specific information on getting your vehicle OBD monitor system ready, please consult your vehicle user manual.

2.5 OBD II Definitions

Powertrain Control Module (PCM) — OBD II terminology for the on-board computer that controls engine and drive train.

Malfunction Indicator Light (MIL) — Malfunction Indicator Light (Service Engine Soon, Check Engine) is a term used for the light on the instrument panel. It is to alert the driver and/or the repair technician that there is a problem with one or more of vehicle's systems and may cause emissions to exceed federal standards. If the MIL illuminates with a steady light, it indicates that a problem has been detected and the vehicle should be serviced as soon as possible. Under certain conditions, the dashboard light will blink or flash. This indicates a severe problem and flashing is intended to discourage vehicle operation. The vehicle onboard diagnostic system cannot turn the MIL off until the necessary repairs are completed or the condition no longer exists.

DTC — Diagnostic Trouble Codes (DTC) that identifies which section of the emission control system has malfunctioned.

Enabling Criteria — Also termed Enabling Conditions. They are the vehicle-specific events or conditions that must occur within the engine before the various monitors will set, or run. Some monitors require the vehicle to follow a prescribed "drive cycle" routine as part of the enabling criteria. Drive cycles vary among vehicles and for each monitor in any particular vehicle. Please refer to the vehicle's factory service manual for specific enabling procedures.

OBD II Drive Cycle — A specific mode of vehicle operation that provides conditions required to set all the readiness monitors applicable to the vehicle to the "ready" condition. The purpose of completing an OBD II drive cycle is to force the vehicle to run its onboard diagnostics. Some form of a drive cycle needs to be performed after DTCs have been erased from the PCM's memory or after the battery has been disconnected. Running through a vehicle's complete drive cycle will "set" the readiness monitors so that future faults can be detected. Drive cycles vary depending on the vehicle and the monitor that needs to be reset. For vehicle specific drive cycle, consult the service manual.

Freeze Frame Data — When an emissions related fault occurs, the OBD II system not only sets a code but also records a snapshot of the vehicle operating parameters to help in identifying the problem. This set of values is referred to as Freeze Frame Data and may include important engine parameters such as engine RPM, vehicle speed, air flow, engine load, fuel pressure, fuel trim value, engine coolant temperature, ignition timing advance, or closed loop status.

Fuel Trim (FT) – Feedback adjustments to the base fuel schedule. Short-term fuel trim refers to dynamic or instantaneous adjustments. Long-term fuel trim refers to much more gradual adjustments to the fuel calibration schedule than short-term trim adjustments. These long-term adjustments compensate for vehicle differences and gradual changes that occur over time.

2.6 OBD II Modes of Operation

Here is a basic introduction to the OBD II communication protocol.Mode byte: The first byte in the stream is the mode number. There are 10 modes for diagnostic requests. The first byte in the response data bytes is this same number plus 64. For example, a mode 1 request would have the first data byte = 1, and the response would have the first data byte = 65. Here is a brief description of the modes:

Mode $01–Identifies the Powertrain information and shows current data available to the scan tool. This data includes: DTC set, status of on-board tests, and vehicle data such as engine RPM, temperatures, ignition advance, speed, air flow rates, and closed loop status for fuel system.

Mode $02–Displays Freeze Frame data. Same data as in mode 1,but it was captured and stored when a malfunction occurred and a DTC was set. Some of the PIDs for mode one are not implemented in this mode.

Mode $03–Displays the type of powertrain or emission related DTCs stored by a 5 digit code identifying the faults. There may be more than one response message if there are more trouble codes than will fit in the data bytes of the response message, or if there are more than one ECU computer responding.

Mode $04–Used to clear DTCs and Freeze Frame data. This clears all diagnostic trouble codes that may be set including freeze frame data and readiness monitors.

Mode $05–Displays oxygen sensor test results. This mode displays the oxygen sensor monitor screen and the test results gathered about the oxygen sensor.

There are ten numbers available for diagnostics: 1.$01 Rich-to-Lean O2 sensor threshold voltage. 2.$02 Lean-to-Rich O2 sensor threshold voltage.

3.$03 Low sensor voltage threshold for switch time measurement. 4.$04 High sensor voltage threshold for switch time measurement. 5.$05 Rich-to-Lean switch time in ms.
6.$06 Lean-to-Rich switch time in ms.
7.$07 Minimum voltage for test.
8.$08 Maximum voltage for test.
9.$09 Time between voltage transitions in ms.

Mode $06–Non-continuously Monitored Systems test results. There are typically a minimum value, a maximum value, and a current value for each non-continuous monitor. This data is optional, and it is defined by a given vehicle maker if it's used.

Mode $07–A request for DTCs (pending) from Continuously Monitored Systems after a single driving cycle has been performed to determine if repair has fixed a problem. This is used by service technicians to verify repair was performed properly and after clearing diagnostic trouble codes.

Mode $08–This special Control Mode requests control of the on-board system, test, or component bi-directionally (where applicable). This mode is manufacturer specific.

Mode $09–Reports vehicle information. This information includes vehicle VIN number and calibration information stored in the vehicle ECUs.

Mode $0A–Requests Emission-Related Diagnostic Trouble Codes with Permanent Status. This mode is required for all emissions-related DTCs.The presence of permanent DTCs at an inspection without the MIL illuminated is an indication that a proper repair was not verified by the on-board monitoring system.

3. Product Descriptions

3.1 Outline

Figure 3-1

No.	Name	Descriptions
①	**OBD II Cable**	Connects the NL101 to the vehicle's Data Link Connector (DLC).
②	**LCD display**	Indicates test results.
③	**ESC button**	Returns to previous menu.
⑤/⑧	**▲ / ▼ button**	Move cursor up or down for selection.
④/⑨	**▶ / ◀ button**	Move cursor right or left for selection; Or turn page up or down when more than one page is displayed.
⑥	**USB port**	Connects to computer to update online.
⑩	**OK button**	Confirms a selection (or action) from menu list.
⑦	**? button**	Help of live data

3.2 Specifications

- Screen: 2.4" TFT 262K true color, 320*240 QVGA LCD display
- Input voltage range: 8~18V

- Operating current: <100mA@12V (Typical)
- Power consumption: < 1.2W (Typical)
- Operating temperature: 32°F~122°F / 0°C~50°C
- Storage tempetature: -4°F~158°F / -20°C ~70°C @ RH60%
- Outline dimension: 4.7'*3.2'*1.0' / 121*82*26 mm LWH

3.3 Accessories

- Main Unit
- OBD 16PIN Diagnostic Cable
- User's Manual — Instructions on tool operations
- USB cable — Connect to a computer for upgrading online

3.4 Power supply

The power of the NL101 is provided via the vehicle's Data Link Connector (DLC). Follow the steps below to power it up:

1. **Find DLC on the vehicle:** The DLC is the connector where diagnostic code readers interface with the vehicle's on-board computer and usually located in the driver's cab.
   A plastic DLC cover may be found for some vehicles and you need to
2. Plug OBD II cable to the vehicle's DLC.

3.5 Battery Check

NL101 could quickly check the vehicle's battery health, read out the current battery value and give out 6 levels of warnings for your knowledge:

A, <10.8V(before Starting): Too Low; Change your battery, otherwise, might not be able to start;

B, 10.8V-11.8V(before starting): Slightly low; Difficult to start, please turn off other electronics and start vehicle to charge;

C, 11.8V-12.8V(before starting): Normal;

D, 12.8V-13.2V(after starting): Too Low; Might not be able to charge the battery, please check other electrical load;

E, 13.2V-14.8V(after starting): Normal;

F, >14.8V: Too High; Might damage the battery, please check the engine stabilizer;

4. Connections & General Operations

4.1 Connections

1. Turn the ignition off.

2. Locate the vehicle's DLC (Vehicle Diagnostic Socket).
3. Plug the OBD 16PIN Diagnostic cable to the vehicle's diagnostic socket;
4. Turn the ignition on. Engine can be off or at idle running.
5. Then NL101 will enter the main menu interface, as shown in Figure 4-1.

Figure 4-1

Function Items	Descriptions
OBDII/EOBD	Diagnose your car.
I/M Monitor	Read Readiness status
Battery Check	Check the battery health
DTC Lookup	The description of trouble code
Setup	To configure the system date and time and turn on / off the beeper.
About Me	Software & Hardware version information

CAUTION: Don't connect or disconnect any test equipment with ignition on or engine running.

4.2 I/M Ready Test

The Ready Test can be used as a convenient readiness test tool by automotive technicians to determine if the tested vehicle is ready for an emission test. By visual and audible indication, you will learn a vehicle's monitors readiness. Repairs to the emissions-control systems of a 1996 or newer vehicle cause the vehicle's computer (ECU) memory to be cleared. The vehicle must go through a drive cycle to allow the ECU to perform a series of tests to ensure that the repair was successful, and before a state mandated emissions test can be conducted. But how will you know when it is ready? With this scan tool, you don't have to drive around endlessly and continuously coming back to the repair shop for retest if all required tests by the ECU are completed. And you could also do a quick check of the vehicle to determine if it is ready to receive an emission test without the hassle of connecting your vehicle to the analyzer or having to use a complicated scan tool.In the following cases, this function is especially useful.

You bought a used car and the check engine light had been cleared to mask potential problems.
You disconnected the battery for tune-ups and other engine repairs, dead battery replacement, car radio installation and car alarm installation.

You used a scan tool to clear the DTCs. Your car has been sent to repair.

4.3 Battery Check

Check the battery health, read out the current battery power value and give out 6 warning tips for your to maintain your battery.

4.4 DTC Lookup

The DTC Lookup function is used to search for definitions of DTCs stored in the DTC library and for code breaker information.

1. From Main Screen (Figure 4.1), use the [▲] / [▼] scroll button and [▶] / [◀] scroll button to select DTC Lookup and press the [OK] button.
2. From DTC Lookup screen,use the [▶] / [◀] button to move to the desired character,use the [▼] / [▲] button to change selected digit/character and press the [OK] button to confirm.
3. View the DTC definition on screen. When DTC definition covers more than one screen,use the LEFT/RIGHT button or UP/DOWN button to view additional information on previous/next screens.

4.5 Setup

Select [Tool Setup] in the main menu and press [OK], the system will enter the system setup screen:

1. **Beeper:** Turn ON/OFF the Beeper. Once Beeper is set to ON, the voice will come when starting and press the key.
2. **Language:** Configure the system language to your preference.
3. **Unit system setting:** Set the measurement unit system.

5. Diagnose

When more than one vehicle control module is detected by the scan tool, you will be prompted to select the module where the data may be retrieved. The most often to be selected are the Power train Control Module [PCM] and Transmission Control Module [TCM].

CAUTION: Don't connect or disconnect any test equipment with ignition on or engine running.

1. Turn the ignition off.
2. Locate the vehicle's 16-pin Data Link Connector (DLC).
3. Plug the scan tool cable connector into the vehicle's DLC.
4. Turn the ignition on. Engine can be off or running.
5. Turn on the scan tool. Use the UP/DOWN scroll button to select OBDII/EOBD from the Main Screen (Figure 4.1).
6. Press the OK button to wait for the Menu to appear. A sequence of messages displaying the OBDII protocols will be observed on the display until the vehicle protocol is detected.

If the scan tool fails to communicate with the vehicle's ECU (Engine Control Unit) more than three times, a

“LINKING ERROR!” message shows up on the display.

- Verify that the ignition is ON;
- Check if the scan tool’s OBD II connector is securely connected to the vehicle’s DLC;
- Verify that the vehicle is OBD II compliant;
- Turn the ignition off and wait for about 10 seconds. Turn the ignition back to on and repeat the procedure from step 5.

If the “LINKING ERROR” message does not go away, then there might be problems for the scan tool to communicate with the vehicle. Contact your local distributor or the manufacturer’s customer service department for assistance.

7. View a summary of system status (MIL status, DTC counts, Monitor status) on screen. Press [OK] ,a screen similar to Figure 5-9 will appear:

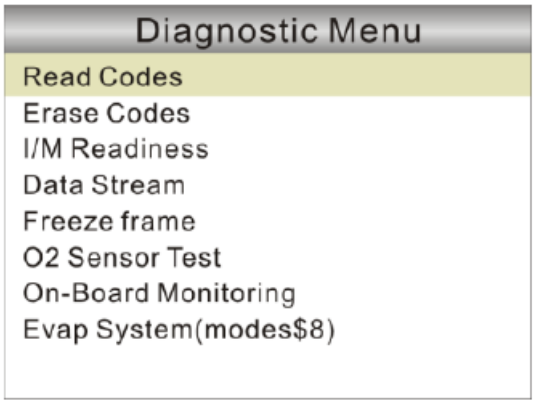


Figure 5-9

5.1 Read Codes

This option is used to read the current, pending or permanent trouble codes.
If the trouble code is found, the system will display the detailed description of the trouble code:

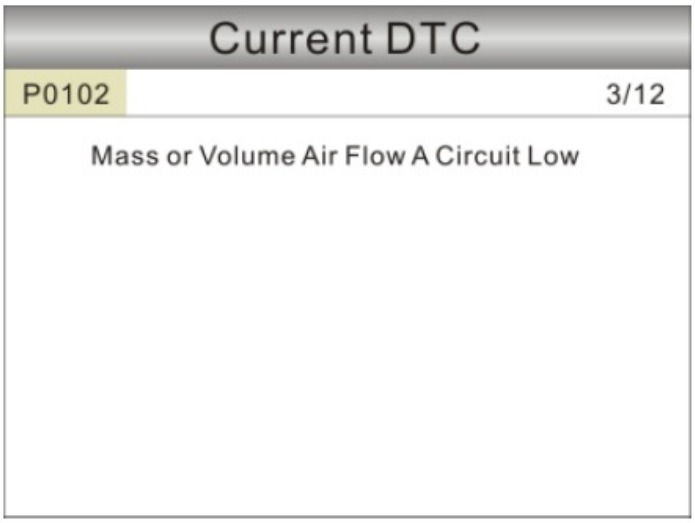


Figure 5-10

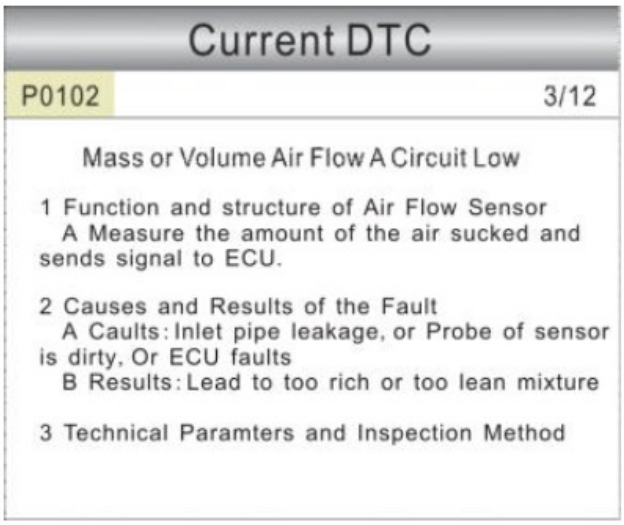


Figure 5-11

In Figure 5-10, 3/12 indicates there are total 12 codes and P0102 is the third code to display.
If the DTC is defined by the manufacturer, a screen similar to Figure 5-11 will appear. In this case, press [OK] to

select the manufacturer from the list and the screen will show the detailed content of the trouble code.
Some DTC have the tips guide, it is the next page of Figure 5-11.It shows the structures of sensor , the cause and Results of Fault and give you the parameters and inspection method.

5.2 Erase Codes

It is used to clear all existing trouble codes.
Notes:

- Before performing this function, make sure to retrieve and record the trouble codes.
- After clearing, you should retrieve trouble codes once more or turn ignition on and retrieve codes again. If there are still some trouble codes in the system, please troubleshoot the code using a factory diagnosis guide, then clear the code and recheck.

5.3 I/M Readiness

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

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

The I/M Readiness Monitor Status function also can be used (after repair of a fault has been performed) to confirm that the repair has been performed correctly, and/or to check for Monitor Run Status.
Note: N/A means not available on this vehicle; INC means incomplete or not ready and OK means Completed or Monitor Ok.

5.4 Data Stream

This item enables you to view all data stream items and the live waveform of all selected items.Some data stream have the help information ,press the [?] .

5.5 View Freeze Frame

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

Note: If DTCs were erased, Freeze Data may not be stored in vehicle memory depending on vehicle.
5.6 O2 Sensor Test

The results of O2 sensor test are not live values but instead the results of the ECU's last O2 sensor test. For live O2 sensor readings, refer to any of the live sensor screens such as Graph Screen.
Not all test values are applicable to all vehicles. Therefore, the list generated will vary depending on vehicle. In addition, not all vehicles support the Oxygen Sensors screen.

5.7 On-board Monitor Test

This function can be utilized to read the results of on-board diagnostic monitoring tests for specific

components/systems.

5.8 Evap System

The EVAP test function lets you initiate a leak test for the vehicle's EVAP system. NL101 does not perform the leak test, but signals to vehicle's on-board computer to initiate the test. Before using the system test function, refer to the vehicle's service repair manual to determine the procedures necessary to stop the test.

5.9 Vehicle Information

This option allows you to view the relevant information of the vehicle, including VIN (Vehicle identification Number), CID (Calibration ID) and CVN (Calibration verification number).

6. FAQ

Here we list some frequently asked questions and answers relating to NL101.

Question: System halts when reading data stream. What is the reason?
Answer: It may be caused by a slackened connector. Please turn off the NL101, firmly connect the connector, and switch on it again.

Question: Screen of main unit flashes at engine ignition start.
Answer: Caused by electromagnetic disturbance and this is normal phenomenon.

Question: There is no response when communicating with on-board computer.
Answer: Please confirm the proper voltage of power supply and check if the throttle has been closed, the transmission is in the neutral position, and the water is in proper temperature.

Question: Why are there so many fault codes?
Answer: Usually, it's caused by poor connection or fault circuit grounding.

Question: What is the USB cable for? And where I can download the software update?
Answer: The USB cable is for software update by connecting ND603 to computer. Please visit www.nexastech.com to know more information about update, regularly we will put the latest software update there for customers to download and update free of charge for lifetime or email us at **service@nexastech.com** to ask about update.

Here are the software update steps:

NOTE: Please prepare one computer with Win XP or Win 7 system, and have WinRAR tool installed.

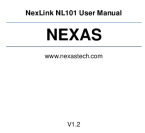
Steps:

1. Download the NL101 update file to your computer (Must be with win XP or win7 system), decompress it and install the update tool on your computer (Win 7 or Win XP);
2. Plug your NL101 into your computer through USB cable , and click to open the update tool;
3. Please select the language you want on the top right "Language List" and Click "UPGRADE" to finish the update;
4. Please go to software menu " SETUP' —" Tool Info" to check if it is latest software version;

Note: All pictures illustrated here are for reference and demonstration purpose only and this User's Manual is subject to change without prior notice.

NEXAS TECH CO.,LTD
www.nexastech.com

Documents / Resources

	**NEXAS Scanner Check Engine Light** [pdf] User Manual Scanner Check Engine Light, NexLink NL101

References

- service@nexastech.com
- NEXAS TECH
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