DESIGNERS AND MANUFACTURERS OF CUTTING EDGE AUTOMOTIVE DIAGNOSTIC EQUIPMENT.

OBD INFORMATION

GENERAL INFORMATION ABOUT OBD DIAGNOSTIC

INTRODUCTION

This document is a simple introduction to the use of the NANOCOM to perform OBD diagnostic, and its purpose is to explain what the NANOCOM is able to do and what it can not do, and so help the users to make the best use of the NANOCOM. Each ecu installed on a vehicle and connected to the OBD socket is able to exchange information thanks to an external diagnostic system, and through specific functions this diagnostic system must be able to manage that information to show it and eventually give the user the possibility to modify it.

It is possible to regroup the diagnostic functions in the following groups, which is valid for almost all ecus.

- FAULT CODE FUNCTIONS: The ecus have a faults register where they store the faults found during their work. These functions allow the user to read and clear the content of the faults register.
- SETTING FUNCTIONS: These functions allow the user to see and in some cases modify the functional options (ENABLE DISABLE) or some parameters (NUMERIC or LIST OF VALUES) of the ecus.
- INPUTS FUNCTIONS: The ecus give the user the possibility to read dynamically the parameters and values used in the process. These parameters can be ON-OFF for the switch connected to the ecu, analogue or numeric for the sensors, calculated values, or information coming from the interconnections with other devices.
- OUTPUTS FUNCTIONS: These functions allow the user to force on and off the actuators, relays, motors, valves, connected to the ecus in order to have a direct test of their functionality.
- UTILITY FUNCTIONS: Each ecu can have a group of specific functions closely related to the process managed by the ecu itself. The alarm ecu has the key programming, the engine ecu has the immobilization synchronization functions, the ABS has the brake tests and so on.

The NANOCOM has a main menu that lists all the ECUs managed and each item of the main menu has a submenu where the functions of that ecu are listed.

Many users make the mistake to think that there is only one ecu that performs all car's management. The car has many ecus, each with a different purpose, and each of them use a different communication protocol, even if they are connected to the same wire.

It is important to know that the NANOCOM cannot communicate at the same time with more than one ecu, so the user must perform different diagnostic sessions for each ecu. Another important thing to know is that the NANOCOM is only an interface to get to know the information that the ecu is able to give, but it has no capability to fix the problems; so the user has to investigate about the problems with the help of the vehicle's workshop manual and it has to create his own knowledge about how the ecus work inside the car.

NOTE: The general functions described above are not implemented on all ecus, and that because the ecu itself may not have the full diagnostic capability implemented.

HOW TO USE THE FAULT CODES

If available, the fault codes reading gives the user the possibility to see the faults that the ecu has detected during its work. The fault messages are not interpreted by the Nanocom: they are showed the way the ecu has stored them in the register.

There are some important considerations to do:

- The faults that you can read are what the ecu supposes it is happened, but it has not the intelligence to investigate and understand the true cause of the problem; it only recognises which sensor gives it the information. The user must read the error and carefully evaluate the source of the problem and especially remember that the faults can be caused by the sensor itself, by the wiring of the sensor or in many cases by a fault of the mechanical part which interact with the sensor.
- The faults cleaning asks the ecu to clear the register, but it can happen that the fault logged are still present in the next reading. This is not a Nanocom or ecu problem, it is just because the fault previously logged was a real fault and it is still present and so logged again. In that case the faults must be fixed with a technical intervention.
- Some ecus may have some faults related to some accessories that are not installed on the vehicle, those faults never goes away after cleaning and they must to be considered irrelevant.

The best way to use the faults to troubleshoot a problem is to read-clear and read them again without moving the car and turn the ignition off and on to understand if there are some permanent faults and evaluate if those errors may be considered irrelevant. Now, to understand if those suspect faults are true faults and how to fix them, it is necessary to recreate the same condition, so turn on the engine, move the wheels or anything that can recreate the faulty situation. If the suspect errors will be logged again it means that there is a true problem to fix.

HOW TO USE THE SETTINGS

The settings normally don't require any modification and the user must carefully understand with the help of the workshop manual the meaning of each setting before modifying them. The NANOCOM allows the user to store the settings of an ECU. We suggest to save a copy of the settings file before modifying them to easily come back to the original condition. The Settings modifications can create serious problems to the ecu functionality so we suggest to use them with the maximum care.

HOW TO USE THE DYNAMIC INPUTS READING

The dynamic input reading allows the user to see in real time the values of the sensors and some other internal parameters used by the ecus to perform their functions. That dynamic reading helps to find some strange values, even if it is not a constant fault.
The inputs values can be SWITCH type, which can have only couples of values ON-OFF, 0V-12V, ACTIVE-NOT ACTIVE, or analogue type which have numeric values.
Defining the right reference values to have diagnostic reference is not easy for all values because they are related to the condition of use when they are read.
Some values are showed with real measurement units as Bar, Kpa, rpm, gr/hr etc. , other values are the values of the conversion from analogue to digital. This last type of values are less easy to evaluate so we suggest to understand their range of values by comparing each other in the different conditions of use and with different cars. The NANOCOM gives the possibility to store the dynamic reading inputs and see them anytime without having the car connected.
The dynamic reading helps also to verify if a fault read has a relationship with some of the values and so to find a way to fix the problem.

HOW TO USE THE OUTPUTS TESTS

These functions allow the user to force on and off the actuators, relays, motors, valves connected to the ecus in order to have a direct test of their functionality.
An example that explains the utility of these functions is the test of the electric window. The electric window of the Discovery II is managed by the BCU unit and possible faults of the

window may be the switch, the BCU or the actuator. If you force the window actuator you see immediately if it works, and verifying the switch by means of the INPUTS function allows to find where the problem is.

UTILITY FUNCTIONS

These functions are specific of each ecu and so please look for more information at the documentation of the relative module.