

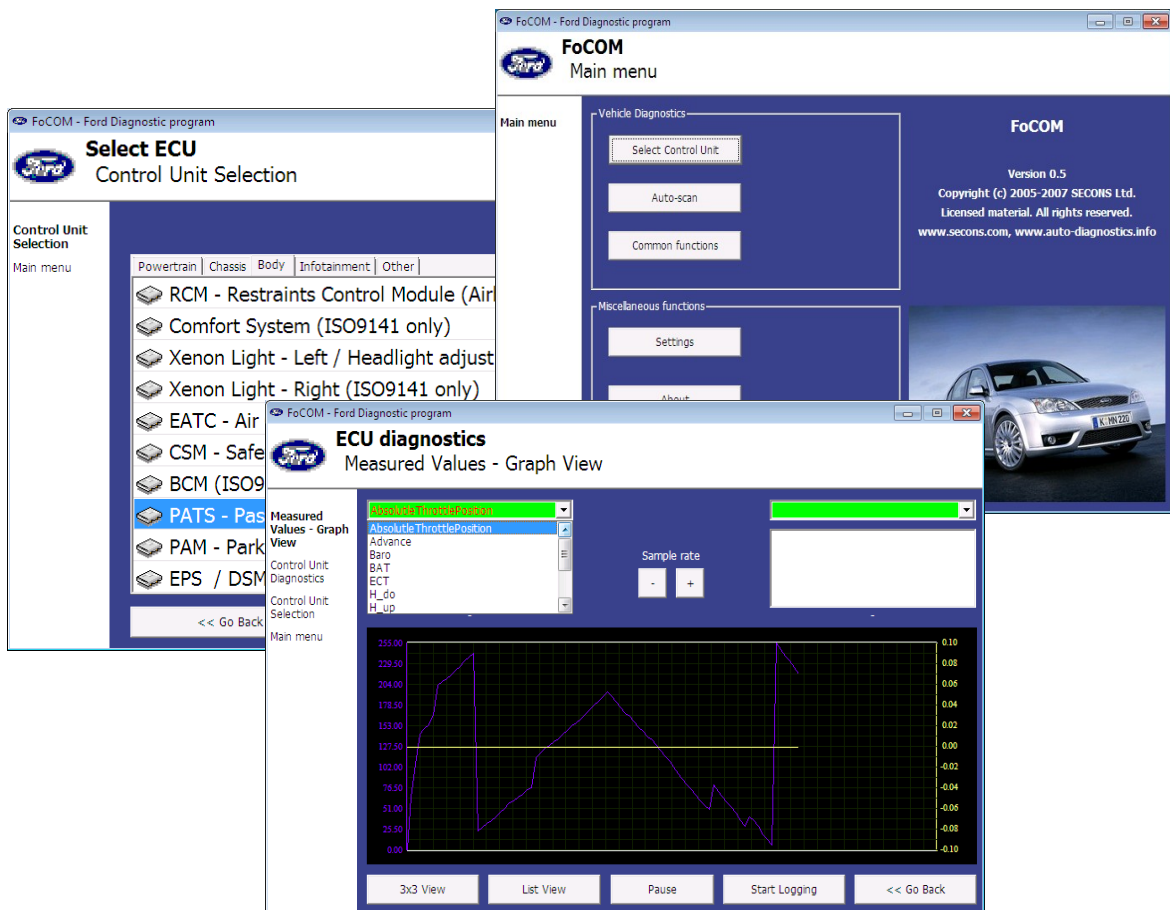
SECONS

FoCOM

User manual

www.obdtester.com/focom

PRELIMINARY VERSION



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1 Introduction

Thank you for purchasing the FoCOM diagnostic interface and software. FoCOM is professional tools for diagnostics of Ford vehicles. Please read carefully this User Manual before using the product. If you have experience with original diagnostic tool Ford IDS, we recommend you to study chapter comparing both systems .

We hope you'll find our products useful. In case you have any questions, problems or feedback please contact as at support@secons.com. We're here to help!

1.1 Key features

- FoCOM covers for wide range of ECUs and models.
- Easy connection via smart multiplexing USB to OBD2 interface
- Wide range of communication protocols and buses covered incl. J1850 PWM, ISO, CAN
- Automatic ECU recognition
- Automatic vehicle scan
- ECU Identification
- Fault code (DTC) reading
- Fault code clearing
- Measured vaules / live data
- Live data recording
- Diagnostic protocol printing
- Actuator tests
- Coding functions
- Printing
- Logging

The FoCOM system works with Ford vehicles. It works as well with Ford subsidiaries vehicles such as Mazda, Lincoln, Mercury, Jaguar, but without guarantee of 100% functionality. The rule of thumb is: tasks related to fault code memory and identification are reliable everywhere, but measured values and other functions may not be fully supported.

1.2 Software update

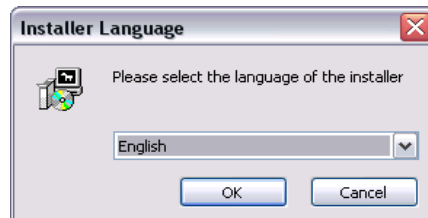
Software updates in diagnostic version are available for free. After entering FoCOM interface serial number you can download them from <http://www.obdtester.com/cz/download>. We recommend you to maintain software up-to-data, because updates provides support for new ECUs and fix various FoCOM issues.

We recommend you to update firmware in diagnostic interface by clicking on *Settings* → *Upgrade firmware* every time you update the software.

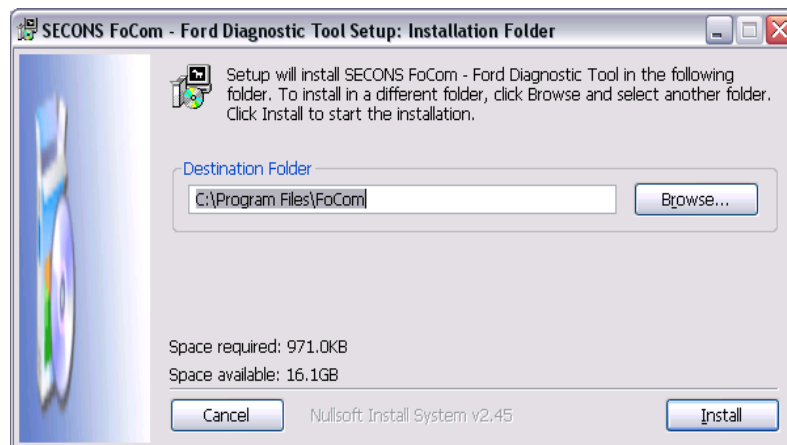
2 FoCOM software and driver installation

2.1 Microsoft Windows operating System

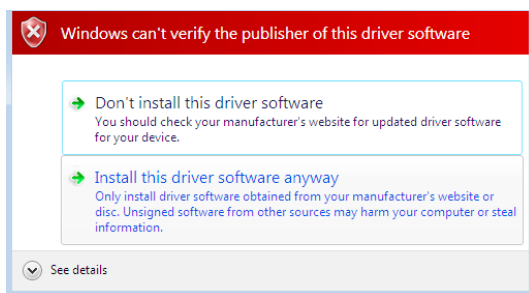
1. Insert FoCOM installation CD to your CD-ROM drive
2. Run installation file FoComSetup.exe
3. Choose language for the installer



4. Choose your destination folder for the FoCOM and click *Install* button and after successful installation click *Close* button.



FoCOM drivers are automatically updated during the FoCOM installation. When prompted to install „unsigned“ drivers, click on *Install this driver software anyway* (Microsoft® Windows® 7) or *Continue Anyway* (Microsoft® Windows® XP.).



Microsoft® Windows® will automatically install drivers when you plug-in the FoCOM to USB port.

Driver installation isn't required for operation on GNU/Linux system.

2.2 GNU/Linux System

Our diagnostic application are tested to work under Linux. No native Linux binary is available, however we have created our programs to work under Linux and other systems using Wine.

2.2.1 Requirements

- Linux 2.6.x with USB support (or FreeBSD)
- USB CDC Driver
- Wine 1.0.1

Recent Debian Linux or Ubuntu meet the above requirements.

2.2.2 Setting up devices

Driver installation isn't required for operation on GNU/Linux system. Diagnostic applications require access to /dev/ttyACMx devices from Wine environment. This can be set-up very easily using these commands:

```
ln -s /dev/ttyACM0 ~/.wine/dosdevices/com5
ln -s /dev/ttyACM1 ~/.wine/dosdevices/com6
ln -s /dev/ttyACM2 ~/.wine/dosdevices/com7
ln -s /dev/ttyACM3 ~/.wine/dosdevices/com8
```

Diagnostic interface should be then visible from the FoCOM diagnostic application.

2.2.3 Installation

Programs can be installed by launching setup .exe file using wine, e.g. wine FoCOMSetup.exe.

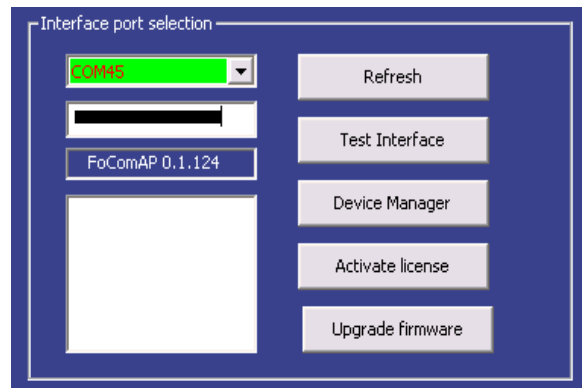


You can download the latest version of FoCOM from www.obdtester.com/downloads

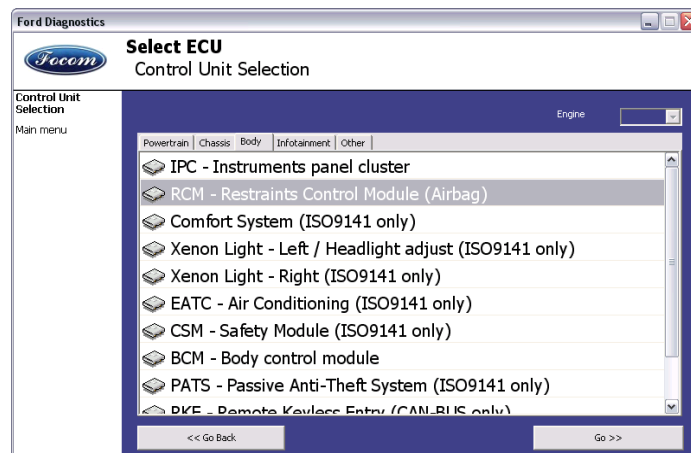
3 First steps

1. Connect the FoCOM interface to your computer.
2. Connect the FoCOM interface to OBD-II connector in the vehicle or in the electronic control unit.
3. Set-up FoCOM application

Select *Settings* from OBDTester main menu and configure interface port. After click *Refresh* button software should find port to which is FoCOM interface connected. Choose these port. Click *Test Interface* to make sure everything is OK, you should see fulfilled *Serial number* (now hidden in black line).



4. Save settings and return to main menu.
5. Turn ignition ON, but don't start an engine.
6. Select ECU by click *Select Control Unit* button.
7. In new window choose unit from list. It is common that low-cost vehicles have only a few control units e.g. PCM, ABS, IPC, RCM.

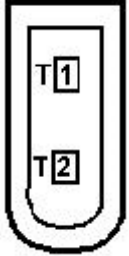


8. If unit was recognized, you can use diagnostic functions now. In other case, you should study chapter *Unrecognized Control Unit* before using diagnostic functions.

4 Diagnostic connectors used in Ford vehicles

Location of diagnostic connector (database of vehicle images) is available from main menu of FoCOM.

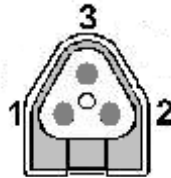
4.1 2-pin



Is used only for diagnostics of older vehicles by DLC protocol.

4.2 3-pin

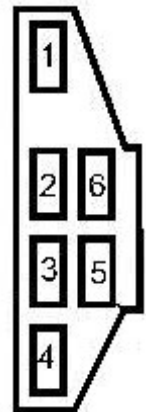
1	GND
2	DCL
3	DCL



This connector is used only for diagnostics of older vehicles by DLC protocol.

4.3 6-pin

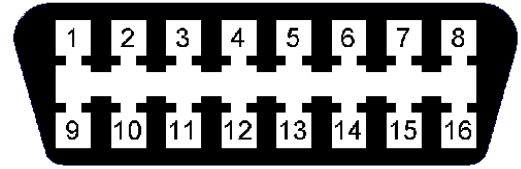
1	
2	
3	
4	
5	GND
6	



This connector is used only for diagnostics of older vehicles using CART protocol.

4.4 OBD-I

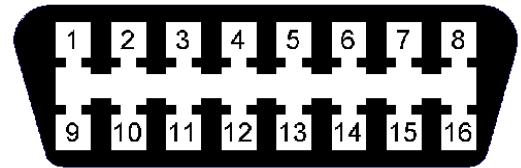
	1	9	
	2	10	
Ford DCL Bus +	3	11	Ford DCL Bus -
Chassis ground (GND)	4	12	
Signal ground (GND)	5	13	
	6	14	
ISO9141 K Line	7	15	ISO9141 L-Line
	8	16	



This connector is used only for diagnostic of older vehicles by DLC protocol, connector is compatible with OBD-II connector.

4.5 OBD-II

	1	9	
SAE J1850 Bus +	2	10	SAE J1850 Bus -
MS CAN High	3	11	MS CAN Low
Chassis ground (GND)	4	12	
Signal ground (GND)	5	13	Flash. Pgm. Volt.
HS CAN High	6	14	HS CAN Low
ISO9141 K Line	7	15	ISO9141 L-Line
	8	16	



Diagnostic connector is mandatory in all vehicles after 2000, is used from 1996.

5 Connecting to control units

Every vehicle after 1996 contains at least one ECUs (Electronic Control Unit), powertrain control unit (PCM) is present everytime, in modern types also ABS, RCM(Airbag), perhaps even IPC(Instrument Panel Cluster), BCM (Body Control Module) and many others.

5.1 Ford ECU terminology

PCM – Powertrain Control Module

ICU – Injector Control Unit

TCM – Transmission Control Module

EPS – Electronic Power Steering

IPC – Instrument Panel Cluster

– Marked also HEC (Hybrid Electric Cluster)

RCM – Restraint Control Module – airbags, etc.

– Marked also ECS (Electric Cluster System)

BCM – Body Control Module

GEM – General Electric Module

PATS – Immobiliser (Passive Anti-Theft System) – may be part of other ECUs

5.2 Communication protocol

Protocol	Bus	Production
DCL (CART)	DCL (RS485)	1988 – 1996
Ford SCP	SAE J1850 PWM	1996 – 2005
Ford ISO	ISO9141	1996 – 2008
ISO 15765	CAN-BUS (ISO 11898)	2003 – present
UDS (ISO 14229)	CAN-BUS (ISO 11898)	2008 – present

5.3 The most common PCMs

Gasoline: EEC-IV, EEC-V, EEC-VI, EEC-VII, SIM21, SIM22, SIM24, SIM28


Diesel: EEC-V, SID802, SID803, SID804, Delphi, BOSCH EDC16

5.4 PATS – Immobiliser (Passive Anti-Theft System)


PATS is vehicle immobilizer used in Ford vehicles since 1998. PATS functionality is present in PCM, IPC, BCM or separated PATS ECU, according PATS version.

Ford uses tTexas Instruments or Texas Instruments Crypto transponders (vehicles since 2001). Several generations of PATS are used.

Operations with PATS are authorised by timing access (delay before operation is allowed, so called Timed PATS) or by entering INCODE (Coded PATS). For coded PATS ECU generates OUTCODE, for which you need to enter correct INCODE. INCODE depends on OUTCODE

-  OUTCODE and consequently INCODE are time dependent, these are not fixed codes.
INCODE authorization service is available on www.patscode.com or you can use Ford ETIS.

5.5 Diagnostic of TCM and ICU

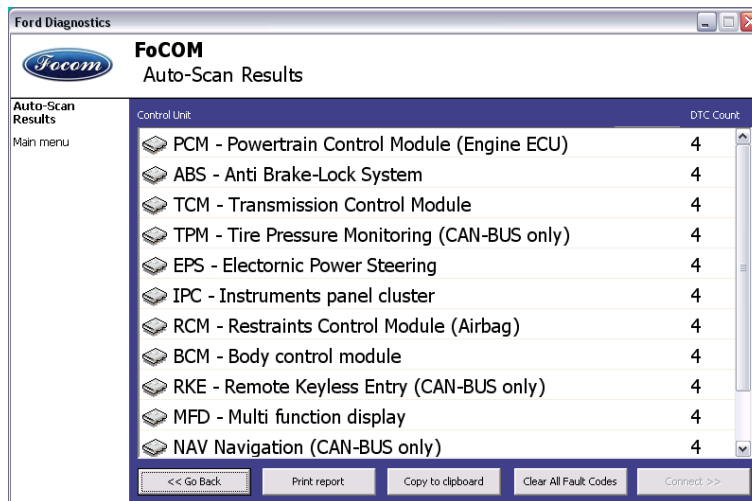
-  Automatic Transmission Control Unit (TCM) can be diagnosed via PCM.
Injector Control Unit is always diagnosed from PCM.

5.6 Diagnostic of Ford Galaxy and Ford Ka

Ford Galaxy I (1995-2000) Ford Galaxy II (2000-2006)	Both generations were manufactured as a joint venture product between Ford and VW. You need use VCDS software (former VAG-COM), VAG1552 or VAS5052 to diagnose them.
Ford Galaxy III (2006-present)	can be diagnosed by FoCOM in standard way.
Ford Ka I (1996-2008)	can be diagnosed by FoCOM in standard way.
Ford Ka II (2008-present)	You need use Fiat Examiner or FiCOM or to diagnose them. This vehicle is manufactured as a joint venture product between Ford and Fiat.

6 Autoscan

This function scans for all known ECUs, and shows the list of ECUs present in vehicle along with number of diagnostic trouble codes.



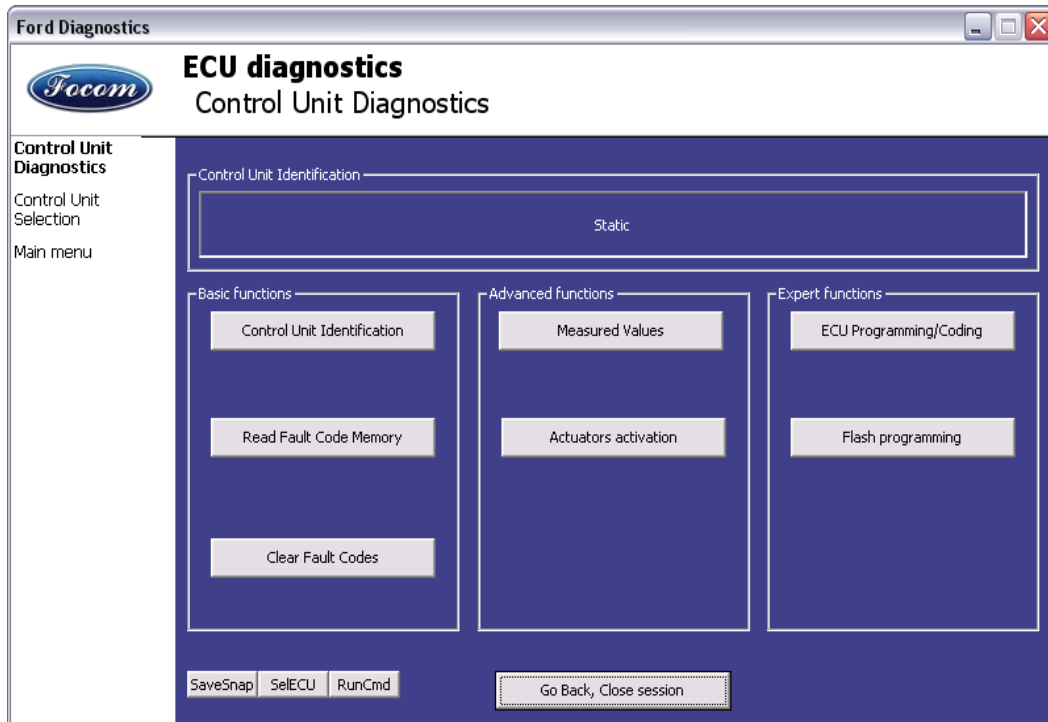
This function is identical with Network Test function in IDS.

7 Diagnostic functions

You can connect with ECU by choosing unit from list of ECUs or Autoscan menu.

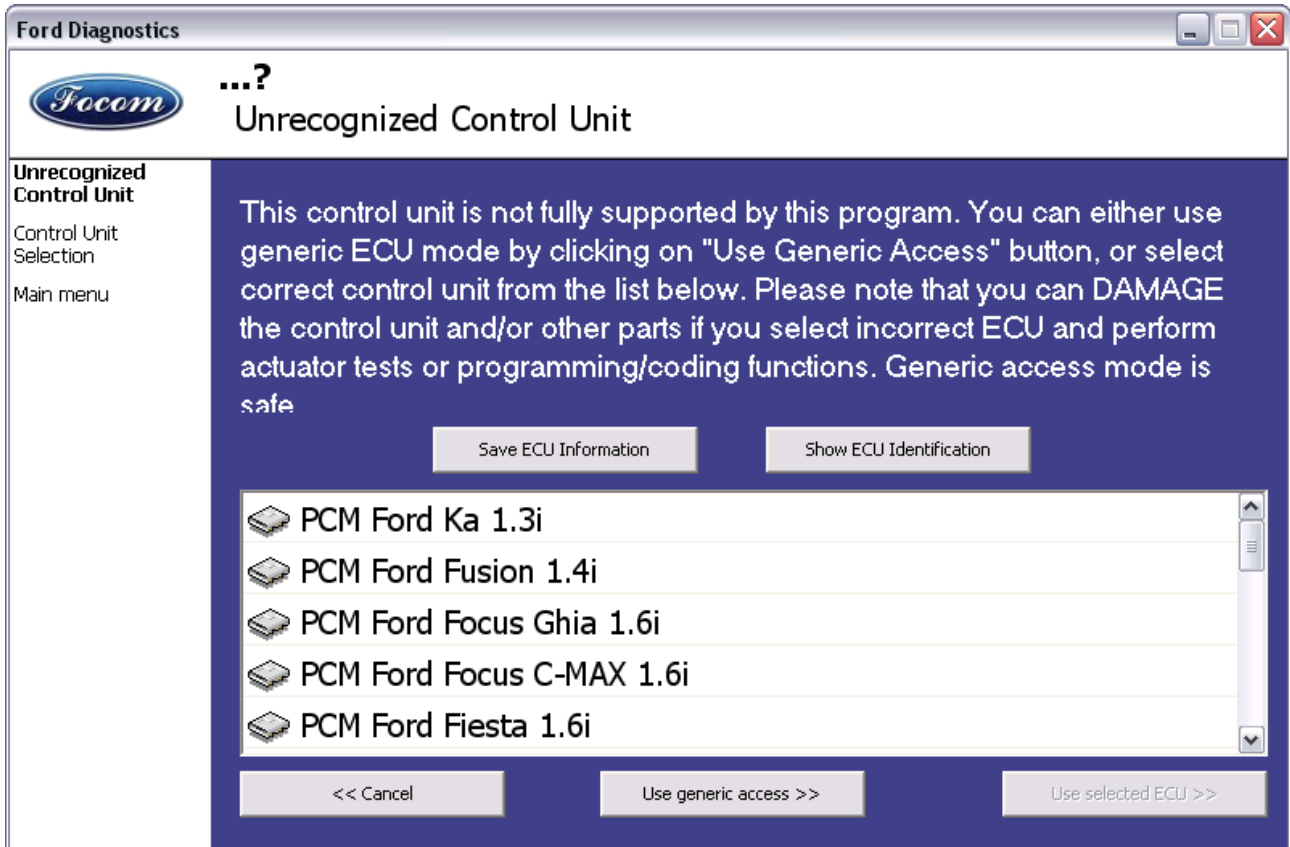
If control unit was identified uniquely, diagnostic menu will be available. If control unit wasn't identified uniquely, you have to choose concrete ECU from list.

Diagnostic menu is divided into three parts. Basic functions, Advance functions and Expert functions.



7.1 Unrecognized Control Unit

Unfortunately control units in Ford vehicles in some cases do not return unique identification or FoCOM may not correctly identify control unit. In such case is it necessary to choose right type of control unit from list.



In this situation, you can either use generic ECU mode by clicking on *Use Generic Access* button, or select correct control unit from list below.

You can get more information about ECU by clicking *Show ECU Identification* button.

Some ECUs (especially those before 2003) don't contain identification data, therefore *Unrecognized Control Unit* information will **always** appear.



- You should necessarily choose right ECU for correct measuring of measured values.
- If you make mistake in identification, you shouldn't make any programming functions.

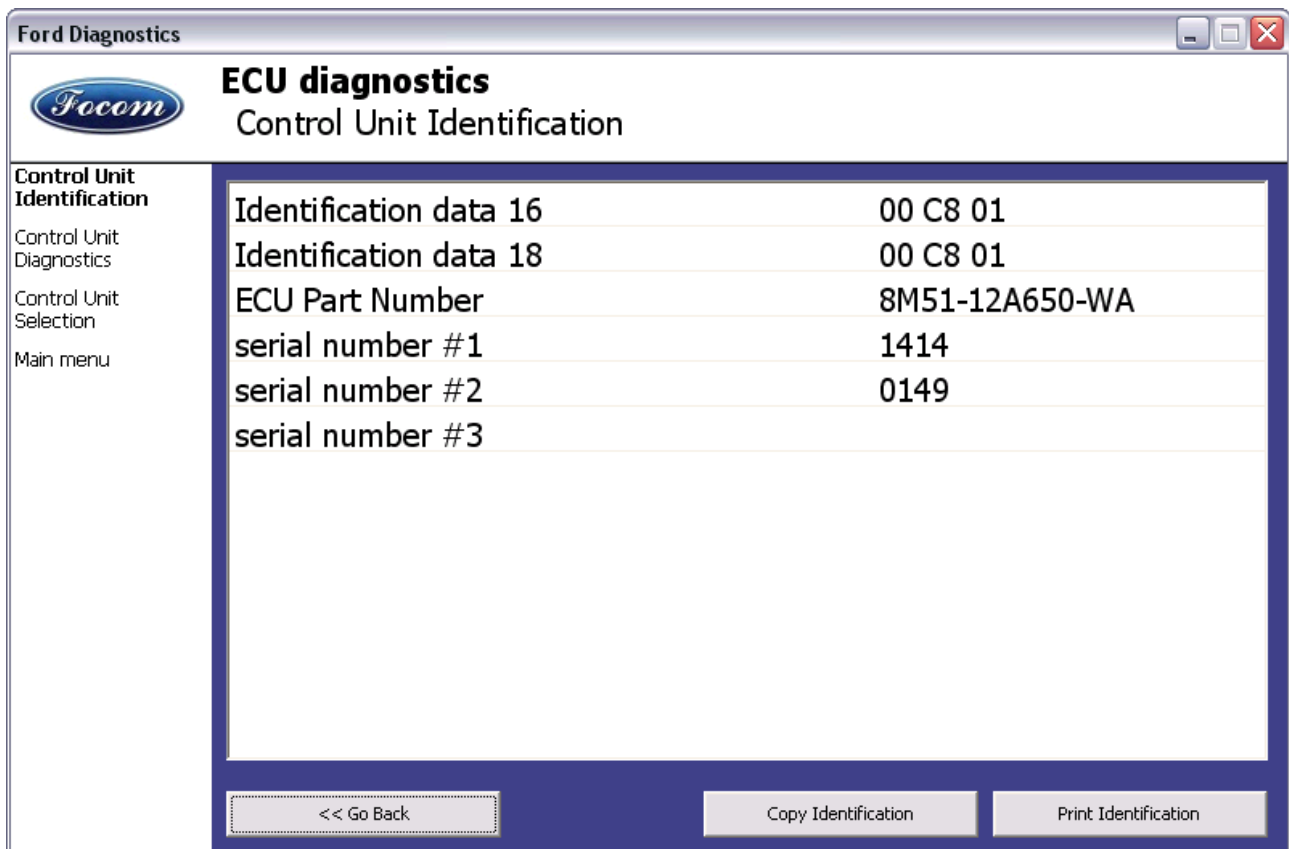
Function *Save ECU information* make possible to save all development information about ECU to hard disc. We asking users to send these files to us. We would like to add support to these ECU to next version of FoCOM.

7.2 Control Unit Identification

This function can display only identification data accessed by ECU, for example:

- Identification data
- ECU part number
- serial number

Incomplete identification are very common mainly for older ECUs that do not provide full part number or VIN code.

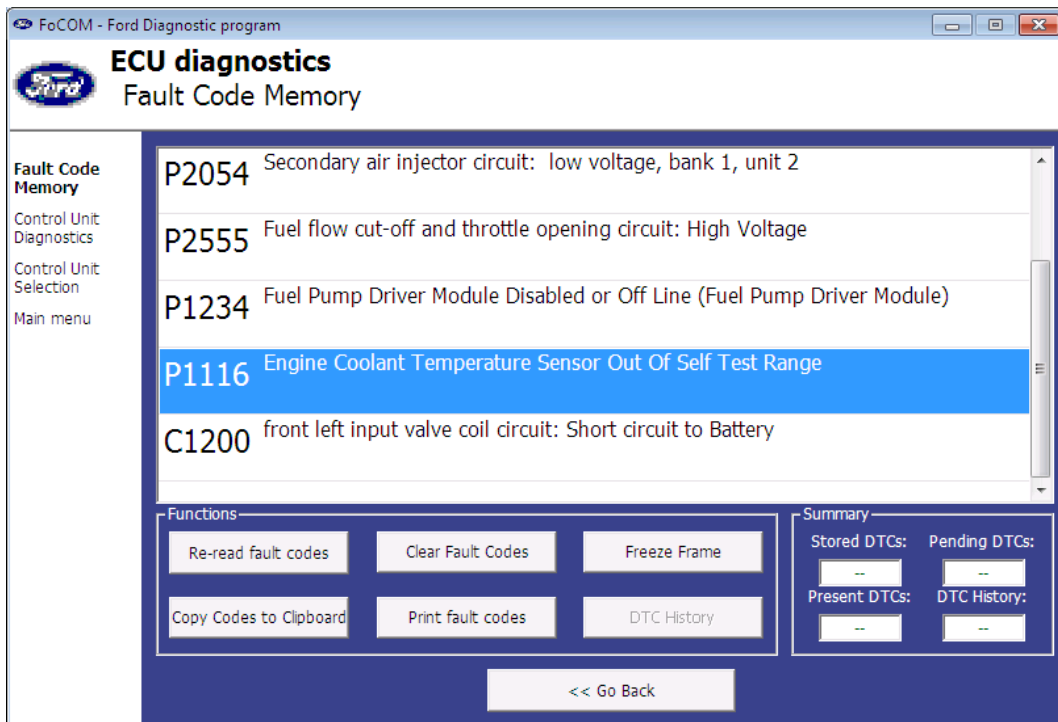


Each ECU should contain valid VIN code. If VIN is not supported, identification should display it. If it isn't provided, you can program it in function *ECU Programming/Coding*, accessible from menu *Control Unit Diagnostics*.

You can print identification by clicking *Print Identification* button or you can copy to clipboard by clicking *Copy Identification*.

7.3 Read fault code memory

This function allows to read and display diagnostic trouble codes saved in memory of control unit (so called CMDTC).



7.4 Clear Fault Codes

This function clears fault code stored in ECU memory.

Clearing memory isn't guaranteed. Fault codes might appear again or under some conditions isn't possible to clear fault codes at all. Its possible that in the presence of some faults control unit doesn't allow to clear fault codes or fault is in no time written back to memory.

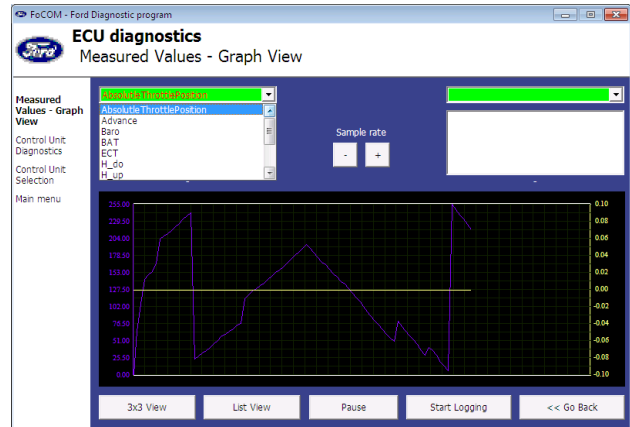
Is recommended to read memory by clicking *Re-read fault codes* button again.

7.5 Measured values

7.5.1 Graph display

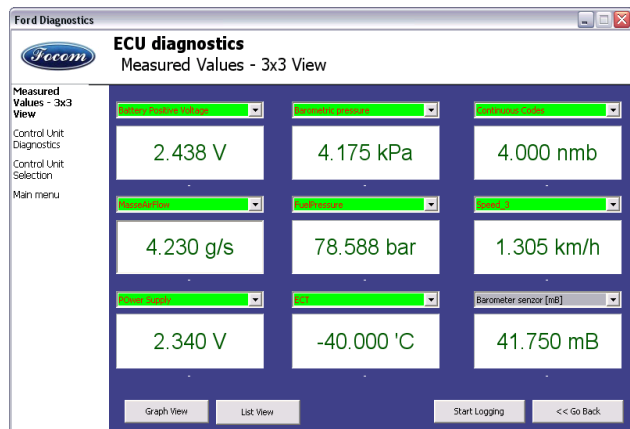
This function displays two measured values (also known as live data or sensor values) simultaneously. Measured parameters can be chosen from selectors at the top of the window.

Buttons + and – allow to accelerate or decelerate speed of graph.



7.5.2 Display 3x3

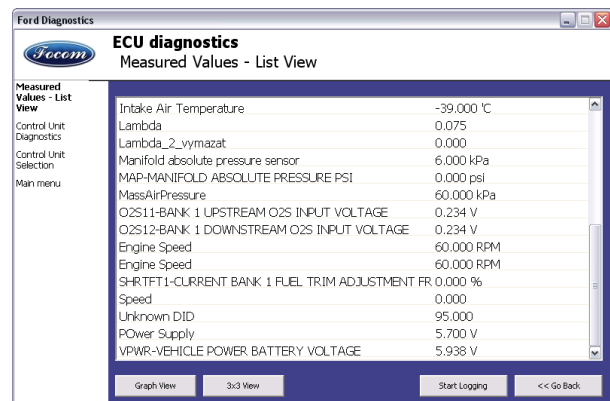
For measuring 9 value simultaneously, click on *3x3 View* button.



7.5.3 Display list

To measure all available values simultaneously, click *List view* button.

Please note values means slower refresh rate.

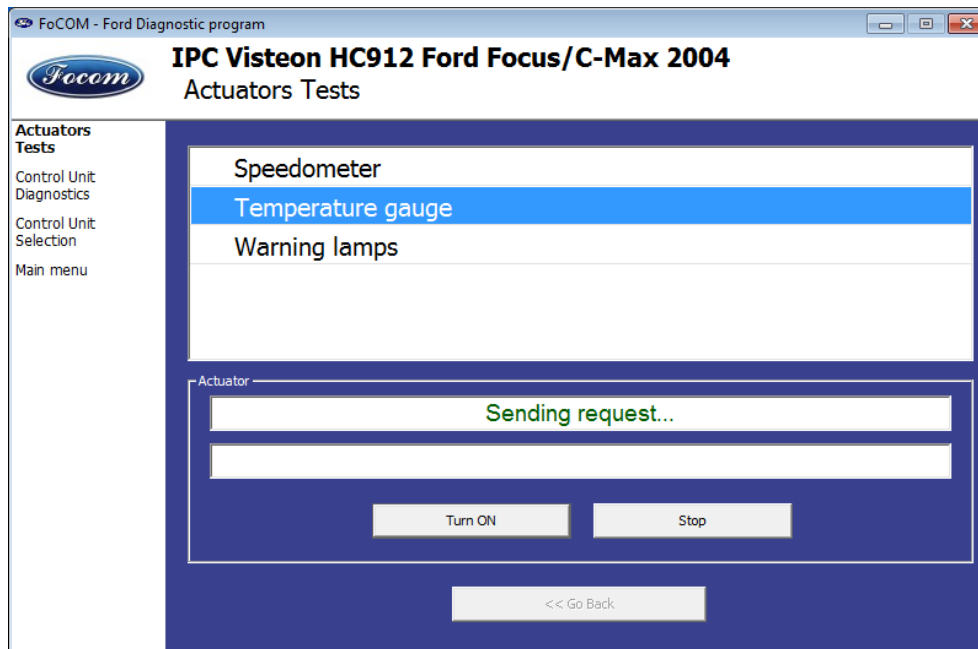


7.5.4 Save to log

Measured values can be saved/logged to a file by clicking *Start logging* button. The logfile is standard csv file and it is compatible with VagScope or can be imported to Microsoft Excel or OpenOffice Calc.

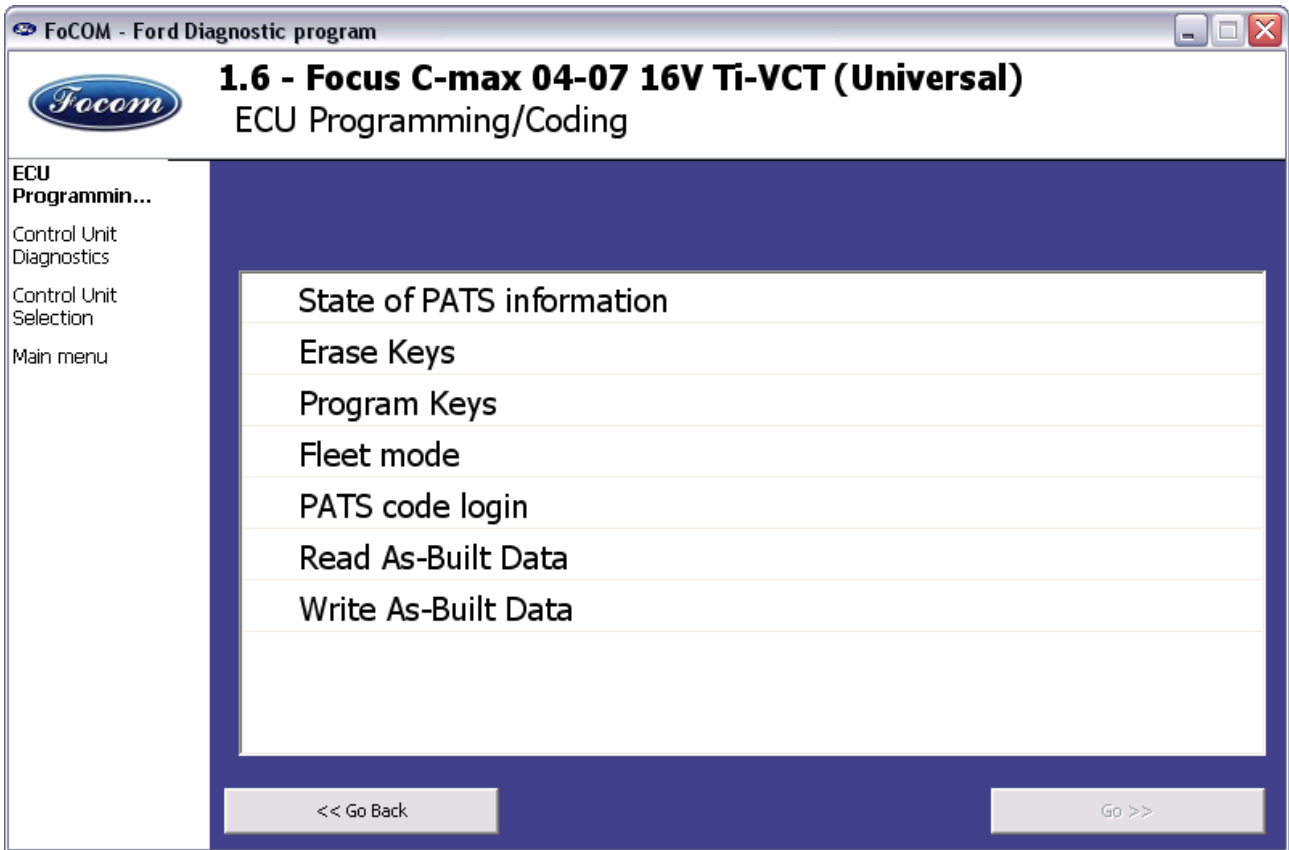
7.6 Actuators activation

This function can activate actuators and perform some actuators actions.



7.7 Programming functions

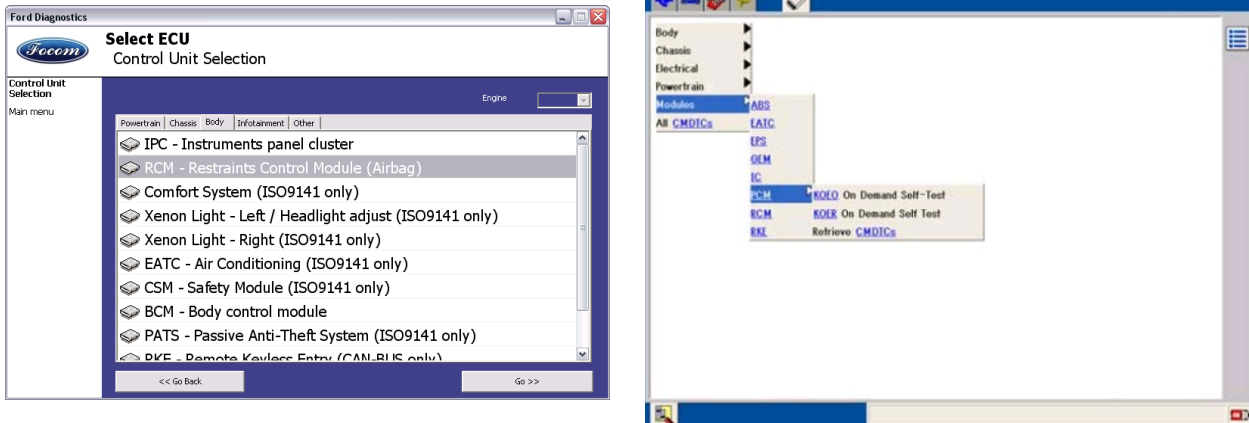
This function allow you to e.g. programming VIN code, operate with immobiliser (PATS) or programming calibration data of injectors.



8 Ford IDS and FoCOM comparison

This chapter describes comparison of functions of FoCOM with original Ford Motor Diagnostics IDS (Integrated Diagnostic System).

8.1 Control unit selection



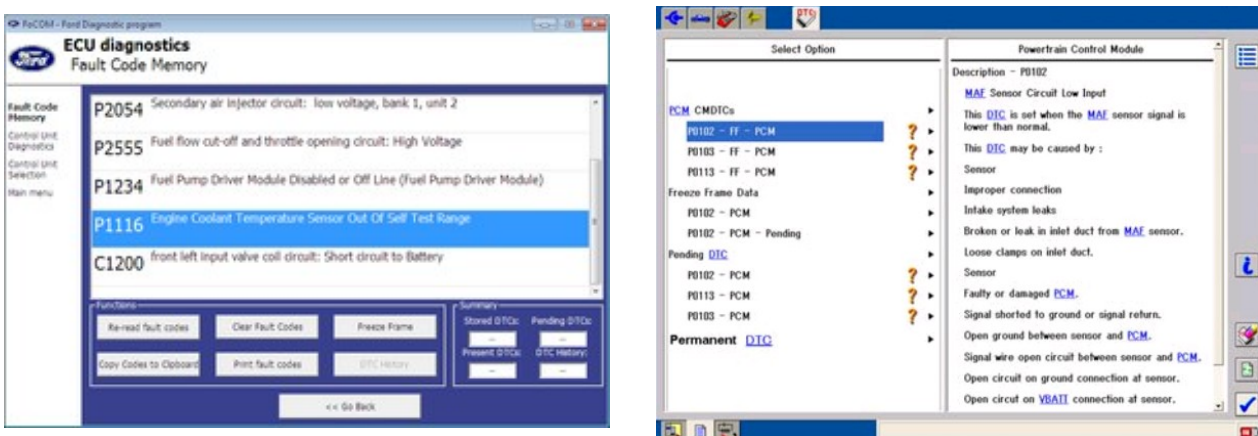
Main difference between concepts of program FoCOM and system IDS is in user approach to vehicle and its systems.

The IDS uses so called Function system, which first chooses function (e.g. Read trouble codes) and then control unit (e.g. PCM).

FoCOM chooses control unit first and then function.

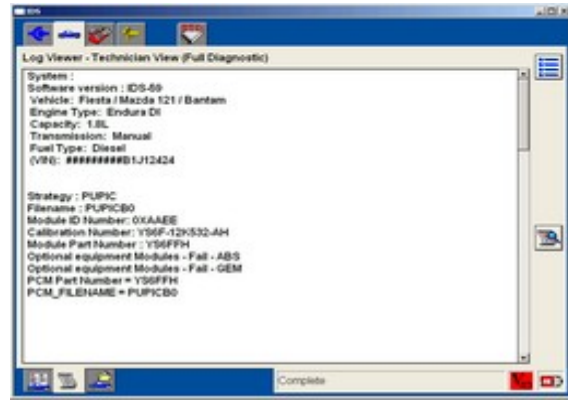
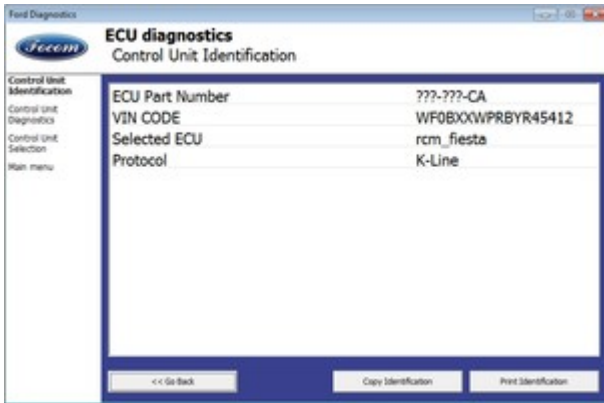
Advantage of second approach is especially similarity with other diagnostic systems (e.g. VCDS, etc.) and consequently more user friendly for those who have not much experience with IDS. Next advantage is easier identification of concrete type of control unit for programming etc.

8.2 Fault codes



Reading and Clearing Diagnostic Trouble Codes acted like IDS system, all CMDTC (*Continuous Memory Diagnostic Trouble Codes*) are read and clear from control unit.

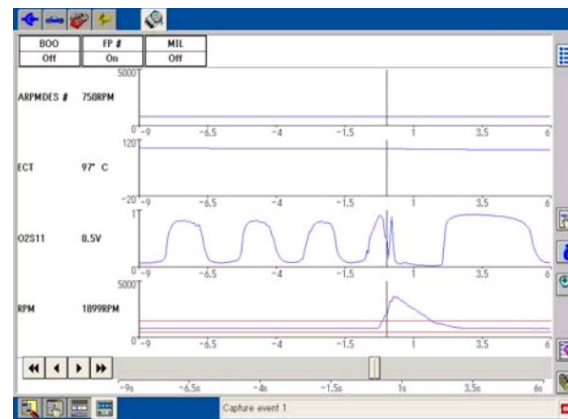
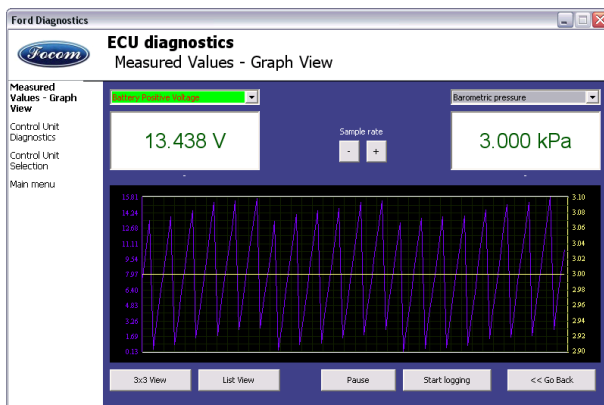
8.3 Identification



Ford IDS does not provide this function, however is possible to display some identification information in Log Viewer – Technician View (Full Diagnostic).

FoCOM use special function for reading identification information.

8.4 Measured values (Datalogger)



Unlike IDS system the FoCOM implements three options of displaying measured values:

- Graph – for comparison two measured values simultaneously in graph
- Display 3x3 – appropriate for see display from longer distance
- Display list – for display all available measured values

It isn't necessary to set vehicle equipment, which is sometimes hardly observable, FoCOM displays all measured values, provided by control unit.

The FoCOM can sometimes display more values than IDS system, e.g. in Engine control unit is commonly available distance moved from last clearing flash memory (this function isn't supported in IDS system).

8.5 Actuator activation

Actuator activation is implemented in same way like IDS system.

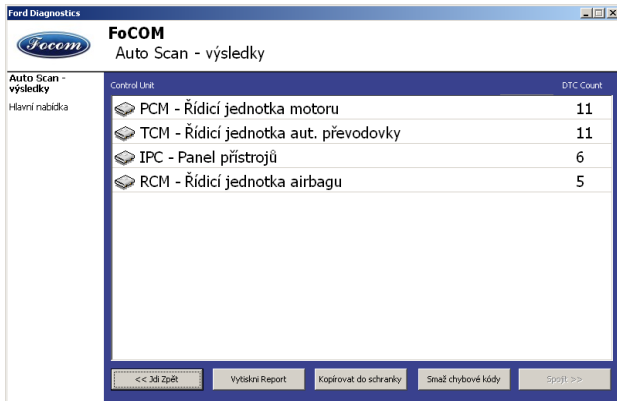
8.6 Programming function

Direct Flash / EEPROM programming functions are described in separate document and require additional license.

8.7 Autoscan (Network test)

This function scans for all known ECUs, and shows the list of ECUs present in vehicle along with number of diagnostic trouble codes, thus provide test of network.

Both functions Network Test (IDS) and Autoscan (FoCOM) are identical.

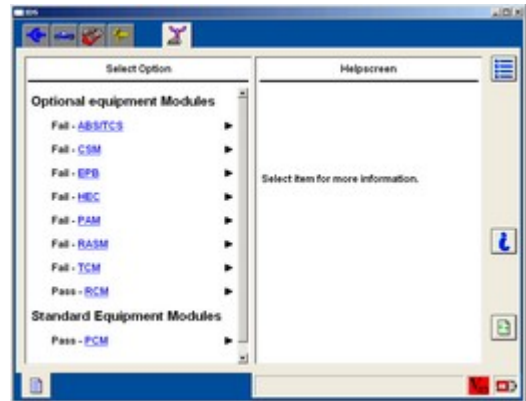


Ford Diagnostics
FoCOM
Auto Scan - výsledky

Control Unit	DTC Count
PCM - Řídicí jednotka motoru	11
TCM - Řídicí jednotka aut. převodovky	11
IPC - Panel přístrojů	6
RCM - Řídicí jednotka airbagu	5

Auto Scan - výsledky
Hlavní nabídka

<< Zpět Vytiskni Report Kopírovat do schránky Smaz chybivé kódy Spust >>



9 Known problems

- FoCOM doesn't diagnose vehicles manufactured in 1990-1995 with DCL/CART(EEC-IV) diagnostics
 - Upgrade will need new interface with DCL support
- Unreliable communication with some control units manufactured by Delphi (e.g. Focus 1.8TDCi)
- Configuration of calibration data of injectors isn't available for all control units

Problems will be solved in near future, FoCOM is still in the works. Corrections will be available in any of next updates.