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SECONS



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1 Introduction

Thank you for purchasing the FoCOM diagnostic interface and software. FoCOM is professional tool for diagnostics of Ford vehicles. Please read carefully this User Manual before using the product. Additional technical information is available from <u>www.DiagWiki.com</u>.

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 <u>support@secons.com</u>. We're here to help!

1.1 Key features

- FoCOM covers for wide range of ECUs and models
- Fully multiplexed all-in-one smart USB2.0 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 values / live data
- Live data recording
- Diagnostic protocol printing
- Actuator tests
- Commands / Coding
- Configuration ("Programmable parameters" in dealer tool)

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.



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

Installer	Language	
1 ²	Please select the language of the inst	aller
	English	~
	OK Cano	el

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

🗒 SECONS FoCor	n - Ford Diagnostic Tool Setup: Installation Folder 📃 🗖 🔯
	Setup will install SECONS FoCom - Ford Diagnostic Tool in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.
	Destination Folder C:\Program Files\FoCom Browse
	Space required: 971.0KB Space available: 16.1GB
W	Cancel Nullsoft Install System v2,45 Install

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.).

Windows can't verify the publisher of this driver software	The software you are installing for this hardware: ELM-USB Interface
 Don't install this driver software You should check your manufacturer's website for updated driver software for your device. Install this driver software anyway Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information. 	has not passed Windows Logo testing to verify its compatibility with Windows XP. [<u>rel me why this testing is important.</u>] Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
See details	Continue Anyway

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 Microsoft Windows 8 driver installation

In case of problem with installing drivers on Windows 8 64-bit, please follow these steps:

- **1.** Press Windows Key + R
- 2. In the window that appears, type: "shutdown.exe /r / o / f / t 00"
- 3. Press "OK" button
- 4. The System will restart to a "Choose an option" screen
- 5. Select "Troubleshoot" from "Choose an option" screen
- 6. Select "Advanced options" from "Troubleshoot" screen
- 7. Select "Startup Settings" from "Advanced options" screen
- 8. Click "Restart" button
- 9. System will restart to another "Startup Settings" screen
- **10.** Select "Disable Driver Signature Enforcement" (press number on keyboard for option shown on screen F7 or 7)
- 11. Once the system starts, install the diagnostic interface drivers as you would on Windows 7

Windows Vista & 7 required signed all .sys files (we use usbser.sys shipped by Microsoft with valid digital signature). Final version of Windows 8 requires also signed .inf file (which is not in our case). The above procedure helps to override unsigned .inf file. Once driver is installed, the program will work properly.





2.3 Interface busy issue [Microsoft Windows]

In case you receive error "Interface busy" while testing your interface, please make sure:

- 1. You're not running any modem, mobile phone, or printer monitoring application that blocks "COM ports" from being used by other applications.
- 2. You're not running Hella Gutmann software on the same PC. Process called "GMPortal.exe" prevents SECONS diagnostic applications from properly accessing the diagnostic interface. You may temporarily resolve this problem by running "Windows Task Manager", right-clicking on GMPortal.exe process in "Processes" tab and selecting "End process".
- 3. Software modem drivers do not block COM ports.
- **4.** You have selected correct COM port (use "Device manager" button to find port number under "Ports (COM & LPT)" group.

2.4 GNU/Linux System

Our diagnostic application are tested to work under Linux. The applications can be run under Linux, BSD or Apple OS/X on Intel x86 using Wine environment. The installer and applications perform fully automated installation under these operating system.

2.4.1 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.

2.4.2 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.

2.4.3 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 <u>www.obdtester.com/downloads</u>



3 First steps

1. Connect the FoCOM interface to your computer.



2. Connect the FoCOM interface to OBD-II connector in the vehicle. You can use picture gallery for find it, available from main menu – *OBD-II Connector Location* button.

id DLC in menu	Choose a car from this tree to view OBD-II connector location	
	Served Served	
	# Escort 1995	1
	✓ Expedition 2003	
	✓ Fiesta 2007	
	# Focus 1999	
	# Focus 2002	
	🚔 Focus 2005	
	# Focus 2011	
	'∉' Galaxy 1995	
	'∉' Ka 1999	
	Wondeo 1993	
	Wondeo 2000	



3. Set-up FoCOM application

Select *Settings* from FoCOM main menu and configure interface port. After clicking on *Refresh* button, software should find port to which FoCOM interface is connected. Choose this port. Then click on *Test Interface* to make sure everything is OK. The software should display *Serial number* and licenses (partially hidden on screenshot on the right side).

COM15 *	Refresh
	Test Interface
FOCOMap 0.1.2241	Activate license
	Upgrade firmware
	Device Manager
	Bluetooth Manager

- 4. Save settings and return to main menu.
- 5. Turn ON the ignition, but don't start the engine.
- 6. Select control unit by clicking on Select Control Unit button.
- 7. Choose diagnostic platform
- 8. In a new window, choose desired control unit.



🔝 FoCOM - Diagnosti	c program for Ford/Mazda		
FoCOM	FoCOM Control Unit Selection		
Control Unit Selection	Diagnostic mode:	Normal	-
Main menu	Powertrain Chassis Body Infotainment		
	September 2014 Powertrain Control Module (Engine ECU)		Â
	PCM - Powertrain Control Module (Engine ECU) to 1996		
	🗇 TCM - Transmission Control Module		
	🗇 TCM - Transmission Control Module III		=
	Second Se		
	🗇 4x4 - Four Wheel Drive		
	🗇 ATCM - All Terrain Control Module		
	SPCM - Secondary Powertrain Control Module		
	STBCM - Traction Battery Control Module		
	SACM - Battery Control Module		-
SECONS	<< Go Back	Go >>	

9. If the control unit was recognized, you can use diagnostic functions now. In other case, you must select correct type of control unit. (chapter <u>Unrecognized Control Unit</u>)

3.1 Software updates

Software updates in diagnostic version are available for free. You can download them from <u>http://www.obdtester.com/downloads</u>. When downloading, type a serial number of your interface as user name. Password leave blank. The serial number can be found in *settings* of FoCOM after performing *test interface*, or on silver label of the interface. We recommend you to maintain software up-to-data, because updates provides support for new ECUs and fix various FoCOM issues. We also recommend you to update firmware in diagnostic interface every time you update the software. Firmware upgrade process is as follows:

- 1. Connect your interface via USB to your computer.
- 2. Go to *settings* of FoCOM and perform *test interface*.
- 3. Click on "Apply Changes" button.
- **4.** Click on "*Upgrade firmware*" button.

Do not disconnect the interface during upgrading the firmware.



4 Diagnostic connectors used in Ford vehicles

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



Is used only for diagnostics of older vehicles by DCL/CART protocol.

4.1 3-pin

1	GND
2	DCL
3	DCL



This connector is used only for diagnostics of older vehicles by DCL/CART protocol.

4.2 6-pin





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

SECONS

4.3 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. 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 Settings

All functions in settings are described below.



SECONS

Language - choose language of diagnostic application user interface in the drop down menu.

Units type - you can choose metric or imperial unit system for measured values.

Refresh - this button refreshes COM port selection drop down list. Correct COM port number should be already chosen after connecting diagnostic interface via USB to PC and clicking on *Refresh* button. If not, choose correct COM port number from the list. It is needed in order to perform successful interface test.

Test interface – before each use of program, please test proper function of your connected interface by clicking this button. After successful test, you can see a serial number of your interface displayed below the COM port field, then firmware version and information about active licenses.

Activate license – this button is used for activating new license/s to use the program or special functions. Internet connection is required. Standard license is already activated for all interfaces before purchase.

Upgrade firmware – use this button to upgrade firmware in your diagnostic interface every time after installing the latest software version (available at <u>www.obdtester.com/downloads</u>). Do not disconnect your interface during upgrading the firmware.



Device Manager – is used to finding out correct COM port number, or to reinstall drivers. Your device appears as "ELM-USB Interface (COMx)" under "Ports (COM & LPT)".

Bluetooth Manager – is a preparation to upcoming bluetooth feature. The button is currently inactive.

Expert functions

<u>Development functions</u> - Enables additional functions under development. This setting is not saved before program exit and will be cleared on every application start. Do not enable this option unless requested by SECONS support staff as these functions may be dangerous to use without proper instructions.

<u>Expert mode</u> – Enables additional functions such as special coding functions or additional configuration options. These functions are intended for experienced technicians and are provided on "AS IS" basis, with absolutely no guarantee. It is highly recommended to leave this option unchecked. This mode also eliminates some warning messages and questions.

Protocol settings

You can set various timings for each communication protocol. This is advanced feature used for example when problems occur with connection to control unit caused by slower ECU response and the like.

Restore Defaults – this button restores all modified timings of all protocols to default values.

Changing protocol settings is not required before normal use of the program. You will be asked to make changes by our tech. support when solving your issue at <u>support@secons.com</u> if necessary.

Debug functions

By clicking on **Save Debug** button, you can capture the latest data from elapsed communication between control unit and program into one file. Providing this file is required only by our technical support. Based on these data, we are able to monitor the whole process of performed operation and its correctness.



Use of debug function is important for successful resolution of any program failure or verifying its causes. For more information on how to proceed, please read the following chapter <u>Reporting bugs and improvement requests</u>.



6 Connecting to control units

6.1 Diagnostic platform selection

Standard Ford diagnostics – for most of vehicles pre 2015. However, some vehicles from 2013 may already be on the new platform. Then is necessary choose "2015+ platforms".

2015+ platforms – for these vehicles from 2015: Mustang, Explorer, S-MAX, Galaxy, Mondeo, Fusion, Tourneo Connect, Transit Connect, Transit Custom, Tourneo, F-Series.

Volvo diagnostics - for Volvo vehicles.

Ford Galaxy I and II (1995-2006) – both generations were manufactured as a joint venture product between Ford and VW (based on VW Sharan platform). 2.3L EEC-V PCM and PATS ECUs uses standard protocol. Ford Galaxy after 2006 is based on Ford CD340 platform and uses standard Ford diagnostics.

6.2 Control unit selection

This function will display a complete list of control units. You can select and connect to the specific control unit you wish to diagnose.

It is common that low-cost vehicles have only a few control units e.g. PCM, ABS, IPC and RCM.

All control units present in tested vehicle can be detected by <u>Auto - scan</u> function.

If control unit was recognized, you can use diagnostic functions.

In other case, you should study chapter <u>Unrecognized Control Unit</u> before using diagnostic functions.



6.3 Diagnostics of selected "non-standard" models

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.
Land Rover Freelander (97-06)	You need use BMW diagnostic tool such as BimCOM.

Land Rover Range Rover (94-05)	You need use BMW diagnostic tool such as BimCOM.
EEC-IV	To diagnose EEC-IV control units (1988-1996, Ford Escort up to 1999) use <u>Special Diagnostics</u> \rightarrow EEC-IV (DCL).

6.4 Communication protocols

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

6.5 Information about Ford control units

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

Important notice for Jaguar diagnosis: due to differences and incompatibility between addressing schemes used Jaguar and other Ford Motor Company vehicles some Jaguar ECUs may have different function.

Ford Motor Company ECU	Jaguar ECU
RPSDM – Rear passenger sliding door module	Heater module (Webasto heater)
ILCM – Illuminated Light Control Module	Tire Pressure Monitor
SASM – Steering angle sensor module	Passenger Seat Module

6.6 Ford ECU terminology

РСМ	Powertrain Control Module
ICU	Injector Control Unit
ТСМ	Transmission Control Module
EPS	Electronic Power Steering
IPC	Instrument Panel Cluster
HEC	Hybrid Electric Cluster (same as IPC)



RCM	Restraint Control Module – airbags, etc.
ECS	Restraint Control Module – same as RCM
BCM	Body Control Module
GEM	General Electric Module
PATS	Immobilizer (Passive Anti-Theft System) – also part of PCM/BCM/IPC/RKE
RKE	Remote Keyless Entry

6.7 PATS – Immobilizer (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 Texas Instruments or Texas Instruments Crypto transponders (vehicles since 2001). Several generations of PATS are used.

Operations with PATS are authorized 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 <u>www.patscode.com</u> or you can use Ford ETIS.

6.8 Diagnostics of TCM and ICU

Automatic Transmission Control Unit (TCM) can be diagnosed via PCM.



Injector Control Unit is always diagnosed from PCM.

7 Auto - scan

This function scans for all known ECUs in selected vehicle, and shows the list of ECUs present in vehicle along with number of present or stored fault codes (DCTs).

SECONS

To select diagnostic platform, please read the chapter <u>6.1.Diagnostic platform selection</u>. Autoscan is not supported for platforms Volvo and Ford Galaxy.

Autoscan may take a while for high-end models with many control units.

🕵 FoCOM - Diagnostic	: program for Ford/Mazda		x
FoCOM	FoCOM Auto-Scan Results		
Auto-Scan Results	Control Unit	DTC Cou	unt
Main menu	🗇 PCM - Powertrain Control Module (Engine ECU)	0	
	🗇 TCM - Transmission Control Module	0	
	🗇 FACM - Fuel Additive Control Module	0	
	🗇 4x4 - Four Wheel Drive	0	
	🗇 ATCM - All Terrain Control Module	0	Ξ
	🗇 SPCM - Secondary Powertrain Control Module	0	
	🗇 TBCM - Traction Battery Control Module	0	
	🗇 BACM - Battery Control Module	0	
	🗇 BECM - Battery Energy Control Module	0	
	🗇 FICM - Fuel Injector Control Module	0	
	🥪 GSM - Gear Shift Module	0	-
SECONS	<< Go Back Print report Copy to dipboard	Connect >>	

Fault code count in auto-scan results is for some types of control units only approximate, or may not be supported at all (then will be zero count displayed for each ECU).

Please read relevant values using "Read Fault Code Memory" function after connecting to each ECU.



8 Special Diagnostics

Using special diagnostics you can perform the following special diagnostic tasks.

EEC-IV (DCL) Diagnostics – a diagnostics for old EEC-IV control units used in Ford vehicles to 1996 (up to 1998 for Ford Escort).

Fuel Injection Pump Diagnostics – TDDI Bosch PSG5 – diagnostic procedure described in our manual "Ford Fuel Injection Pump (FIP) coding" available at <u>obdtester.com/downloads</u>.

To diagnose PSG5 VP44 Bosch TTDi fuel pump pleas use direct connection to the control unit using universal 3-lead K/+12V/GND adapter.



High-Speed CAN BUS Analysis, Mid-Speed CAN BUS Analysis, SCP BUS Analysis – these functions are described in our manual "CAN-BUS analysis information" available at <u>obdtester.com/downloads</u>.

Recovery procedure (EECV/VI) – this function is used to recover control units after wrongly performed flash programming.

Functions "Volvo diagnostics", "Diagnostics Mondeo 2015" and "Diagnostics VW Ford Galaxy" are here from historical reasons and they will be deleted. To select these functions use the standard selection control unit.



9 Diagnostic functions

You can connect to ECU by choosing control unit from list of ECUs in selected vehicle or auto-scan listing.

If control unit was identified uniquely, diagnostic menu will be available immediately, otherwise it is necessary to select control unit variant as described earlier in this manual.

Diagnostic menu is divided into three parts. Basic functions, Advanced functions and Expert functions. Basic functions generally safe to use under any conditions. Please note that clearing (deleting) fault code memory may result in additional fault codes appearance even in different control unit(s). Also messages may appear on on-board computer display.

Advanced functions require deeper knowledge of car components. Be careful before activating any actuators – incorrect actuation may damage vehicle components.

Expert functions may have serious consequences if used improperly. Please refer to technical service bulletins and workshop service manuals before running any of these functions.

🔝 FoCOM - Diagnosti	c program for Ford/Mazda		
FoCOM	RCM Bosch CR16 CA Control Unit Diagnost	A 2000,Ford Ka	
Control Unit Diagnostics Control Unit Selection	Control Unit Identification	16 CA 2000,Ford Ka, ISO-KLI	NE, YS5T-???-BA
Main menu	Basic functions	Advanced functions Measured Values Actuators activation	ECU Programming/Coding Configuration Flash programming
SECONS		Go Back, Close session	



9.1 Unrecognized Control Unit

Some Ford control units may do not return unique identification or FoCOM may not correctly identify them. In such case is it necessary to choose correct type of the control unit from list.

🗟 FoCOM - Diagnosti	🔝 FoCOM - Diagnostic program for Ford/Mazda 🛛 👘 💌					
FoCOM	PCM - Power Unrecognized	train Con I Control U	trol Modu l nit	le (Engine ECL	J) - Invalid iden	
Unrecognized Control Unit Control Unit Selection Main menu	No valid identification was returned from ECU. Application thus cannot identify ECU. You can either use generic ECU mode by clicking on "Use Generic Access" button, or select correct control unit from the list below. Please note that you can DAMAGE the control unit and/or other parts if you select incorrect ECU and perform actuator tests or programming/coding functions. Generic access mode is safe.					
		Save ECU Info	mation	Show ECU Identification		
	🧼 1.4 TDCi	- Fusion 20	03 (SID 804	ł)	*	
	🧼 1.4 TDCi	- Fusion 20	07 (SID 804	+)		
	I.4TDCI	PCM Ford Fi	esta			
	Signature State Stat					
	Sector 1.4i PCM Ford Fusion					
	<< Cancel		Use generic ac	cess >>	Use selected ECU >>	

In this situation, you can also use generic ECU mode by clicking on *Use generic access* button, however this mode will not allow you to read measured values.

You can get more information about ECU by clicking on 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 choose correct ECU for correct decoding of measured values.
- If you make mistake in identification, you shouldn't make any programming functions.

Function "*Save ECU Information*" makes possible to save all development information about ECU to hard disc. In case that:

- the installed ECU is not available in the listing



- or you are not sure which control unit to choose
- or you wish to get the ECU automatically properly identified in next FoCOM version
- or you just want to help us to improve FoCOM

We will be more than happy to add support for any unsupported or unrecognized control unit to next FoCOM version. We are usually able to do this within one or two working days based on so called "ECU snapshot file". From "Unrecognized ECU" window or "Control Unit Identification" window please choose "Save ECU Information" button. When prompted if you want to perform fast or full snapshot please choose "No" in order to make fast snapshot (fast snapshot takes less than one minute, full snapshot may take up to 15 minutes for CAN-BUS ECUs or even longer for other communication protocols). Please send the generated file(s) to <u>support@secons.com</u>. For cars manufactured before 2004 we will need also VIN code of the vehicle.



9.2 Control Unit Identification

This function displays identification data provided by the 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.

🗟 FoCOM - Diagnostic	: program for Ford/Mazda				
FoCOM	RCM Bosch CR1 Control Unit Ide	L 6 CA 2000,F ntification	ord Ka		
Control Unit Identification Control Unit Diagnostics Control Unit Selection Main menu	ECU Part Number VIN Code Car Family Selected ECU Protocol Bus Type	r		YS5T-???-BA WF0BXXWPRI Ford Ka 2000 RcmIsoBoschl ISO9141 K7	BYR45412 Bosch_ka_200
SECONS	<< Go Back		Save ECU Information	Copy Values	Print Values

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 on *Print Identification* button or you can copy to clipboard by clicking on *Copy Identification button*.

Save ECU Information button is used to save "ECU snapshot" of tested control unit, as mentioned in chapter "<u>Unrecognized Control Unit</u>" or "<u>Reporting bugs and improvement requests</u>".

9.3 Read fault code memory

This function allows you to read and display diagnostic trouble codes saved in control unit memory.

🗟 FoCOM - Diagnosti	c program for Ford/Mazda 📃 👘 💌				
FoCOM	RCM Bosch CR16 CA 2000,Ford Ka Fault Code Memory				
Fault Code Memory Control Unit Diagnostics Control Unit Selection Main menu	B1869 Airbag lamp circuit B2444 Side impact sensor (driver side) B2445 Side impact sensor (passenger side) B1921 Airbag diagnostic check feature ground circuit: Open circuit				
SECONS	Functions Clear Fault Codes Freeze Frame Stored DTCs: Pending DTCs: Copy Codes to Clipboard Print fault codes Present DTCs: DTC History: <<< Go Back				

Please note that some ECUs (mainly those used in Jaguar) do not support fault code reading at all. Also ECUs that run in bootloader mode (e.g. the ECU is not properly programmed) do not allow fault code reading. In such case, special message is displayed.

1

"Static" error is simply the opposite of "Sporadic" and "Intermittent". When a DTC is marked Sporadic or Intermittent, it means the fault condition that set the DTC did not exist (or could not be detected) at time the DTC read-out was performed.

9.4 Clear Fault Codes

This function clears fault code stored in ECU memory.

Fault codes might appear again or under some conditions isn't possible to clear fault codes at all. It's 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.

It is recommended to read memory by clicking Re-read fault codes button again.



Please note that number of clearing fault codes may be limited for some control unit types.



9.5 Freeze frame

Freeze frame displays conditions at first or last occurrence of currently selected fault code.

🗢 FoCOM - Diagnostic	🖙 FoCOM - Diagnostic program for Ford/Mazda 📃 🖃 🗾					
FoCOM	2.5 EEC-V MLF-521 2000,Ford Cougar Freeze Frame					
Freeze Frame						
Fault Code Memory	Raw Freeze Frame Data	02 01 93				
Control Unit Diagnostics	Raw Freeze Frame Data	03 01 00				
Control Unit	Raw Freeze Frame Data	04 00				
Selection	Raw Freeze Frame Data	05 00				
Main menu	Raw Freeze Frame Data	06 FF				
	Raw Freeze Frame Data	07 80				
	Raw Freeze Frame Data	08 FF				
	Raw Freeze Frame Data	09 80				
	Raw Freeze Frame Data	0C 00 00				
	Raw Freeze Frame Data	0D 00				
SECONS	<< Go Back	Copy Values	Print Values			



9.6 Measured values (live data)

Some control units are not equipped with all sensors: in this case, some sensors may show a limit values (minimum or maximum).

9.6.1 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 the graph.

9.6.2 **Display 3x3**

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

FoCOM	RCM Bosch CR16 CA 2 Measured Values - Gra	2000,Ford Ka ph View		
Measured Values - Graph View		▼ Battery	Positive Voltage	
Control Unit Diagnostics	Battery Positive Voltage Bracket Ground Resistance	Sample rate	0.070.)/	
Control Unit Selection	Diagnostic Trouble Codes Diagnostic Trouble Codes Driver Airbag		0.070 V	
Main menu	Malfunction Indicator Lamp Passenger Airbag	Slow Display	8.7839 - 9.0439	
	Passenger Retractor Circuit Resistance Side Airbag Configuration State of ECU		9.97	
	State of ECU State of ECU		9.57	
	0.01		9.17	
	-0.01		897	
	-0.05		8.37	
	-0.09		8.17 7.97	
Q=Q=re	3x3 View List View	Pause Graph Start lo	gging <<< Go Back	
SECONS				
R FoCOM - Diagnosti	C program for Ford/Mazda	2000 Ford Ka		
FoCOM	Measured Values - 3x3	View		
Measured Values - 3x3 View	Product Convert Resistance	Namentic Toy blo Codes	Rathery Resilius Veltage	
Control Unit Diagnostics	255.000 Ohma	0.000 pmb	9 970 \/	
Control Unit Selection	255.000 Onms		0.070 V	
Main menu	255.0000nms - 255.0000nms	0.000nmb - 0.000nmb	8.8709 - 8.9579	
	4.000 11110	1.000 mode	Active	
	4.000nmb - 4.000nmb	1.000mode - 1.000mode	1.000mode - 1.000mode	
	. <u> </u>			
	•		•	
SECONS	Graph View List View	Slow Display	art logging <<< Go Back	
🕵 FoCOM - Diagnost	ic program for Ford/Mazda			
Fo COM	RCM Bosch CR16 CA Measured Values - List	2000,Ford Ka t View		
Measured Values - List View				

9.6.3 Display list

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

Please note values means slower refresh rate.

Battery Pos	tive Voltage			8.870 V			
Bracket Gro	und Resistance	255.000 Ohms					
Diagnostic	Frouble Codes			4.000 nmb			
Diagnostic	Frouble Codes			0.000 nmb			
Driver Airb	g	0.000 Ohms	0.000 Ohms				
Driver Retra	ctor Circuit Resista	nce A/D Coun	t	0.000 Ohms			
Malfunction	Malfunction Indicator Lamp				Active		
Passenger /	Airbag	0.000 Ohms					
Passenger F	tetractor Circuit Re	sistance		0.000 Ohms			
Side Airbac	Side Airbag Configuration				Inactive		
State of EC	State of ECU				1.000 nmb		
State of EC	J			1.000 mode			
State of EC	J			1.000 mode			
Graph View	3x3 View	Сору	Print	Start logging	<< Go B		

Please note that refresh rate of live data in "list view" depends on communication speed. SCP and ISO ECUs may return data very slowly.

9.6.4 Save to log

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



9.7 Actuators activation

This function is used activate actuators and perform tests (including KOEO and KOER) and various actuator actions.

Some actuator tests may display detected fault codes at the end of the test.

FoCOM - Diagnosti	E program for Ford/Mazda RCM Bosch CR16 CA 2000,Ford Ka Actuators Tests
Actuators Tests	
Diagnostics	Key On Engine Off test
Control Unit Selection	Key On Engine Running test
Main menu	
	– Achiator –
	Please select actuator from the list
	Run Test
SECONS	<< Go Back

Please note that most control units do not allow any specific actuators, only KOEO or KOER tests (this limitation is present also in original dealer tester).

9.7.1 Key On Engine Off test (KOEO test)

KOEO is automated powertrain module test available on most EEC-V and EEC-VI control units. The test must be performed on stopped engine with ignition key in ON position. The KOEO test may require special actions such as turning steering wheel from minimum to maximum, pressing brake and accelerator pedal. For vehicle-specific instructions please refer to Ford service manuals. All problems that were detected during the test are displayed in form of fault codes at the end of test. The test terminates automatically.

The KOEO test should be performed before running KOER test. The KOEO test may affect self-learnt values present in keep-alive memory (KAM).

9.7.2 Key On Engine Running test (KOER test)

KOER is automated powertrain module test available on most EEC-V and EEC-VI control units. The test must be performed running engine. The KOER test may require special actions such as turning steering wheel from minimum to maximum or pressing brake. For vehicle-specific instructions please refer to Ford service manuals. All problems that were detected during the test are displayed in form of fault codes at the end of test. The test terminates automatically.

The KOER test may affect self-learnt values present in keep-alive memory (KAM).



9.8 Programming/Coding functions

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

SECONS

Important notice: Some of the coding functions can not be run when the engine is running and vice versa (some coding functions can not be run unless the engine is running). Some coding operations require specific conditions or procedure to be performed. Please refer to vehicle manufacturer technical service manuals for more information.



Please read carefully all manuals for specific coding operations. The manuals are available online from our website, <u>www.obdtester.com/focom</u>. Additional technical information is available also from <u>www.DiagWiki.com</u>.



9.8.1 PATS (immobilizer) coding and ECU pairing

These functions are used to add/code new keys to a vehicle. More detailed description is available in our PATS coding manual.

9.8.2 Diesel injector coding / pump adjustment

FoCOM supports diesel injector classification coding and fuel pump adjustments on diesel PCM control units where applicable. More detailed description is available in our Ford TDCi Injectors coding manual.

9.8.3 Diesel DPF regeneration

FoCOM supports static/dynamic diesel particulate filter regeneration and reset options on diesel PCM control units where applicable. More detailed description is available in our Ford DPF service manual.

9.8.4 Odometer adjustment

This function is available in IPC control unit and is used to adjust mileage when replacing odometer. FoCOM is capable of changing value up where instrument cluster supports this function.

In addition to the above function special paid module exists that allows changing odometer to any desired value, on both new and used instrument cluster. More information about this **paid** function is available at http://obdtester.com/focom-odometer-correction

9.8.5 Reset ECU

Used to reset ECU (similar to ECU power supply disconnection). The function is useful when recorded fault codes depend on functionality of another control unit(s) or after changing central vehicle configuration.



9.9 Control unit configuration

Many control units contain configurable/programmable parameters. FoCOM is capable of reading/writing this configuration. Newer cars use central configuration (CCF) stored usually in BCM (this means that instead of configuring individual control units everything is carried out on one place).

Two configuration modes are supported:

- 1. ECU AS-BUILT configuration
- 2. ECU customization

FoCOM automatically determines possible configuration modes, in case of multiple choices, FoCOM displays window shown on the right:

👄 FoCOM - Diagnos <u>t</u> ic	program_for Ford/Mazda	
FoCOM	BCM 2010-,Ford C-MAX Configuration Selection	
Configuration Selection Control Unit Diagnostics	Control unit configuration As-Built data	
Selection Main menu		
SECONS	<< Go Back	Go >>

Additional technical information related to control unit configuration or retrofits is available from <u>www.DiagWiki.com</u>.

Reading/writing configuration may require entering ECU flash programming mode. This may result in fault codes related to CAN-BUS/FlexRay communication in other ECUs. It is recommended to perform autoscan after performing any ECU configuration, faults such as "Body Control Module: No Communication", "Vehicle Dynamics Control Module: Invalid Data Received" can be safely cleared and should not re-appear.

9.10 CCF - Central configuration

Some models use central configuration stored in two control units (master copy, backup). For these vehicles please configure everything in CCF Master ECU (see table below). Some ECUs may have individual configuration using AS-BUILT data.

Vehicle	Years	CCF Master	CCF Slave	Individual configuration
Ford Mondeo	2006-2014	BCM	IPC	
Ford Galaxy	2006-2014	BCM	IPC	
Ford S-Max	2006-2014	BCM	IPC	
Ford Transit	2006-	BCM	IPC	RCM
Ford Focus	2010-	BCM	IPC	APIM
Ford C-Max	-2010	BCM	IPC	
Ford Fiesta	2008-	IPC	BCM	



9.11 PCM configuration in VID block

Mainly older control PCM units store configuration in so called VID block. In order to reconfigure VID data PCM control unit flash must be completely re-programmed ("re-flashed").

9.12 AS-BUILT configuration

Each control unit in Ford vehicles contains configuration data as hexadecimal chain. In these data are encoded information from the production, which specifies the functions and equipment of the vehicle. Configuration data can be read from the control unit, or from AS-BUILT database of Ford Motor Company.



Note: These data of configuration doesn't contain coding of injectors function, traveled distance, or informations about immobilizer, and other. Is necessary to perform adaptation of these data using coding operation.

Display of data from the Ford Motor AS-BUILT database (includes data for all controls)

			PC	M Module	BCE Modules
PCM	1	FFFF	FFFF	0310	7A6-01-01 0900 20B0 20A8
PCM	2	2C0C	44FF	FE8B	7A6-01-02 00B0
PCM	3	FFFF	03FF	2F42	7A6-02-01 02B2
PCM	4	FFFF	FFFF	FFOF	720-01-01 6A20 3930 A8C4
PCM	5	FFFF	FFFF	FF10	720-01-02 0100 2B
PCM	6	FFFF	FFFF	FF11	726-01-01 5A0A 93
PCM	7	FFFF	FFFF	FF12	726-02-01 03C0 2222 0037
PCM	8	FFFF	FFFF	FF13	726-03-01 3000 61
PCM	9	FFFF	FFFF	FF14	726-04-01 0E40
					726-05-01 040F 46
					726-06-01 0000 34
					726-07-01 2505 5F
					726-08-01 0101 023A
					726-09-01 2000 57
					726-10-01 8008 0000 00C6
					726-10-02 0000 0000 003F
					726-10-03 0000 0000 0040
					726-10-04 0000 41
					726-11-01 1400 53

AS-BUILT data adjustment / entry in FoCOM (only for currently diagnosed control unit):

SECONS

FocoM - Diagnosti	c program for Ford/Maz	da				
FoCOM	IPC Visteor Control Uni	n 2008,Fo t Configur	ord Focus ration			
Control Unit Configuration Selection Control Unit Diagnostics Control Unit Selection Main menu	720-01-01 720-02-01 720-02-02 720-02-03 720-03-01 720-04-01 720-04-02 720-04-03 720-05-01 720-05-02				0000 2 5454 3 3045 3 3453 4 0000 2 5434 5 5434 5 5345 3 4535 4 5345 3	9 453 54AD 453 547B 534 507C B 353 459F 354 3480 4FA 354 3472 453 4592
	720-05-03	_		_	3453 4	
SECONS	<< Go Back	Edit Load from file	Hex Edit Save to file	Revert to or	iginal Uno	do All Changes Write configuration to ECU



9.13 ECU Programmable parameters (Configuration)

This function allows you to configure control unit parameters, or transfer configuration between ECUs after replacement. It is possible to reconfigure control unit(s) multiple times, thus allowing to re-use control units.

You can see listing of supported codings for each ECU in our FoCOM diagnostics coverage (please note that actual number of configurable parameters may vary due to different ECU variants).

🖙 FoCOM - Diagnosti	c program for Ford/Mazda				
FoCOM	IPC Visteon 2004-20 Control Unit Configura	08,Ford I ation	Focus		
Control Unit Configuration					
Configuration	ABS			Absent	
Selection	AWD			Absent	
Control Unit	Additional fuel heater			Absent	
Control Unit	Cruise control			Present	
Selection	EHPAS		Present		
Main menu	Electric parking brake		Present		
	Focus ST speedometer		Present		
	Instant fuel		Absent		
	Language		Spanish		
	Navigation			Absent	
	Real engine temperatu	re		Disabled	1
	Devening across			Disables	, T
	Edit	Hex Edit	Revert to ori	iginal Undo	All Changes
SECONS	<pre><< Go Back</pre> Load from file	Save to file	Сору	Print	Write configuration to ECU

Always save backup of configuration to a file before making any changes.

If no editable values are displayed, it is still possible to save or restore configuration via a file.



If complete configuration load fails for any reason, it is still possible to continue with ECU configuration data subset.

The configuration data retrieved from the control unit are verified for validity after loading.

First check is performed to validate data consistency (such as data check-sum). If data consistency validation fails, prompt if you really want to continue is displayed. This usually happens only when control unit is not yet programmed, or data are corrupt. The diagnostic application is able to fix this problem when writing new configuration to the control unit. It is possible to continue, however



writing incorrect data to the control unit may damage either control unit or vehicle components.

Then all data are checked for validity. If invalid configuration option is found, warning message is displayed.

The window displays all user changeable values.

Meaning of colors

Grey line	Read-only value (cannot be changed)
Black line	Editable text, original state (not yet edited)
Green value	Editable, changed by user
Red	Un-decoded value
Violet/pink value	Un-decoded changed value

9.13.1 Edit

This button allows you to change currently selected value.

Detailed instructions on valid value format and it's range is displayed.

After editing please check displayed value is correct as it may change – diagnostic application may adjust the value to meet the control unit requirements (the value may get rounded, clipped, etc.)

9.13.2 Hex edit

Available only in expert mode or for values that cannot be correctly decoded. This function is used to directly edit binary representation of the value.

9.13.3 Revert to original

Reverts currently selected value to original state.

9.13.4 Undo all changes

Reverts to original configuration (as retrieved from the control unit when entering this window).

9.13.5 Go back

Returns back to diagnostic menu.



9.13.6 Load

Loads configuration from a file. Data file is checked if matches the connected control unit.

9.13.7 Save

Saves configuration to a configuration file (for restore or configuration transfer) or to a text file (report).

9.13.8 Copy

Copies configuration to operating system clipboard.

9.13.9 Print

Prints configuration.



10 Control unit memory programming

Flash and serial memory programming functionality will be available shortly in special FoCOM programming module (flash programming is available to selected beta testers only, paid feature).



11 Ford IDS and FoCOM comparison

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

11.1 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.

11.2 Fault codes

FoCOM - Diagnost	ic program for Ford/Mazda	Select Option	Powertrain Control Module
Fact Code Hemory Control Unit Dagnostics Control Unit Selection Main menu SECONS	Fault Code Memory B1869 Airbag lamp drcuit B2444 Side impact sensor (driver side) B2445 Side impact sensor (passenger side) B1921 Airbag diagnostic check feature ground circuit: Open circuit Fluctors Reread fault codes Clear Fault Codes Prezer Frame Sammary Started VIC:	ECM CHDICs ? 10102 - 17 - FCM ? P0113 - FF - FCM ? P0113 - FF - FCM ? P0102 - FCM ? P0102 - FCM P0102 - FCM P0102 - FCM P0102 - FCM P0102 - FCM P0102 - FCM P0102 - FCM ? P0102 - FCM ? P0103 - FCM ?	Description - P0102 MAE Sensor Circuit Low Input This DIC is set when the MAE sensor signal is lower than normal. This DIC may be caused by : Sensor Instate system leaks Broken or leak in intel duct from MAE sensor. Loose clamps on intel duct. Sensor Faulty or damaged PCH. Signal shorted to ground or signal return. Open ground between sensor and PCH. Signal wire open circuit between sensor and PCH. Open circuit on ground connection at sensor. Open circuit on ground connection at sensor. Open circuit on ground connection at sensor.
SECONS			

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



11.3 Identification

ECU Part Number	YS5T-???-BA
VIN Code	WF0BXXWPRBYR45412
Car Family	Ford Ka 2000
Selected ECU	RcmIsoBoschBosch_ka_200
Protocol	ISO9141
bus rype	N/



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.

11.4 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).

11.5 Actuator activation

Actuator activation is implemented in same way like IDS system.

11.6 **Programming function**

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

11.7 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.



Select Option		Helpscreen	_
Optional equipment M	odules		
Fall - ABS/TCS			
Fall - CSM			
Fail - EPB		Select item for more information.	
Fall - HEC			
Fall - PAM			
Fall - RASM			
Fall - TCM			
Pass - RCM			
Standard Equipment I	Aodules		
Pass - PCM			



12 Reporting bugs and improvement requests

Our customers can take advantage of our full technical support for free. You can contact our technical support at **support@secons.com** with any technical questions and requests.

In case you encounter to failure of any program functions (e.g. fault codes reading/clearing, coding functions, actuator test, connecting to ECU, test interface, ...), or you miss some function or some function does not work sufficiently, please follow the steps below.

Note:

Before sending support request for failing operation, please make sure you have met all conditions required for the operation (e.g. you are entering correct data, correct engine temperature for DPF regeneration, correct number of keys for engine start, etc).

In case of communication issues we recommend to check diagnostic plug connection and retry procedure at least once, connection problems may result in erratic communication issues.

Please, prepare the following data in your email before sending your request to our technical support:

- 1. Detailed description of failure or your improvement request
- 2. Vehicle description VIN code, model, manufacture year, engine type
- **3.** Attach **Debug Log** (in case that required function doesn't work properly). This file captures data from the latest communication between program and ECU, so we can detect failure causes.
- 4. Attach Snapshot of tested ECU this file contains important information about tested control unit In all cases please attach snapshot of INJ (engine) + BSI (body computer).

12.1 How to create **Debug Log**

It is necessary to perform operation that is not working correctly first. Once failure occurs, go back directly to settings in main menu (do not close the program). Click on "Save Debug" button. Name and save the file into well known directory in your computer.

Enable "Debug mode" check box only at our special request.

This function is used to tell program enable special functions in diagnostics interface and to log more data than required for normal operation.

FoCOM	FoCOM Application Setting	js		
Application Settings Main menu	Contraction Contra	Libits type Netro:	Probacid activity	SO
SECONS		Save Changes	Cancel	Apply Changes





How to create ECU Snapshot

After connection to tested control unit, click on "Control Unit Identification". In following screen, click on "Save ECU Information". Choose directory to save the file and confirm. Saving may take a few minutes.

Please send all support requests along with required data attached to <u>support@secons.com</u>. Your case will be assigned unique ticket ID number in order to communicate efficiently with us.

Reference For Part Part Part Part Part Part Part Par					
FoCOM	RCM Bosch CR1 Control Unit Ide	.6 CA 2000,F ntification	ord Ka		
Control Unit Identification Control Unit Dagnositis Control Unit Selection Main menu	ECU Part Numbe VIN Code Car Family Selected ECU Protocol Bus Type	7		YSST-???-BA WF0BXXWPRI Ford Ka 2000 RcmIsoBoschi ISO9141 K7	BYR45412 Bosch_ka_200
SECONS	<< Go Back		Save ECU Information	Copy Values	Print Values

Also feel free to contact us with any suggestions for improvements in the software on the same *e-mail address*. Your feedback is greatly appreciated.

12.3 Unsupported control unit

In case you are prompted with "Unrecognized control unit" window and:

- the installed ECU is not available in the listing
- or you are not sure which control unit to choose
- or you wish to get the ECU automatically properly identified in next FoCOM version
- or you just want to help us to improve FoCOM

We will be more than happy to add any unsupported or unrecognized control unit to next FoCOM version. We are usually able to do this within one or two working days based on so called "ECU snapshot file":

From "Unrecognized ECU" window or "Control Unit Identification" window (after connecting to ECU), please click on "Save ECU Information" button and save the file to your computer.

Please send the generated file(s) to support@secons.com.

12.4 Problems with configuration

In case you encounter any difficulties with configuration (coding) data, please provide the following:

- Debug log
- ECU snapshots
- Listing of original ECU configuration data (either via saving to a file or "Copy to clipboard")



13 Known problems

• Connection to Japan-made ABS on Mazda 3 2006 may fail (this issue is related to one specific ABS ECU)

Above problems will be resolved in future FoCOM updates.