



[www.cobrartp.com](http://www.cobrartp.com)

## *FlashOnline*

### User Manual

Document revision 2.8





1. Connect (disconnect) the device to the ECU only in a de-energized state. Connecting during operation (switched on) may damage the device or the vehicle's ECU!
2. Be careful when handling the device even when it is switched off due to the presence of a battery (cell CR2032). Short-circuiting the battery for a long time may cause an explosion or fire!
3. Be extremely careful when working with high temperatures!
4. When disconnecting (removing) the cable from the emulator and the SOP44 adapter, pull strictly perpendicularly, in no case do not pull it to the side, you will damage the connector!
5. Carefully study this manual to avoid unwanted consequences! The operation of this device requires certain skills.

# GETTING STARTED

## USB - connection

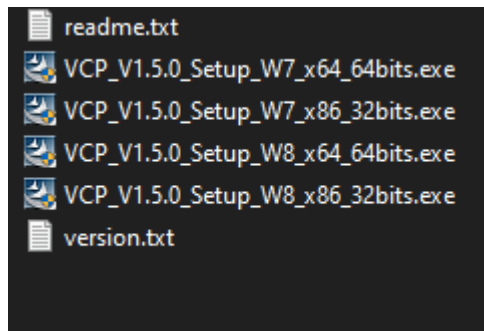
FlashOnline is connected to a PC using a Mini-USB cable.

FlashOnline can only be connected to a PC, i.e. there is no need to install (connect) the emulator in the ECU, or connect a separate power source. Driver installation depends on the board version (see on board as Rev X.X).

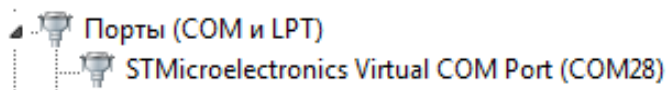
### *Installing of USB Driver for Rev 4.x boards version*

For revisions R4.x and later, the driver is **not required in the case of Windows 10, 11**. If you have **Windows XP, Vista, 7, 8.x** driver installation is required. The driver can also be downloaded from our website: <https://cobrartp.com/en/downloads>.

To install the driver, use the installer for the appropriate version of Windows (W):



After the driver installation is successfully completed, a virtual COM port will appear in the device manager, if there is a connected emulator:



After installing the drivers, you can use the emulator with software.

### ***Install USB Driver for Rev 3.x boards version (old version)***

After connecting, you should have a new device in the Device manager. After that, you need to install the USB driver.

Drivers can be downloaded on our website: <https://cobrartp.com/en/downloads>, by selecting an item for the appropriate version of Windows.

After downloading the driver archive, you must also select the appropriate installer, depending on the bit depth of your operating system x86 (x32) or x64. Drivers tested on Windows XP, Windows 7, Windows 10. Official website of the driver provider: <https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers>.

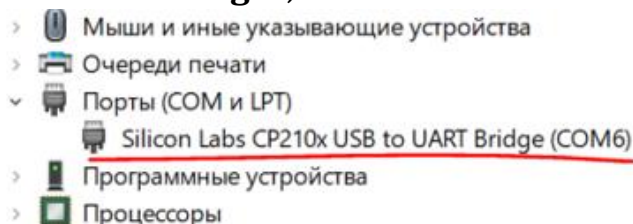
Customization	23.06.2018 0:27	Папка с файлами	
x64	23.06.2018 0:28	Папка с файлами	
x86	23.06.2018 0:28	Папка с файлами	
CP210xVCPInstaller_x64.exe	20.11.2015 9:58	Приложение	1 031 КБ
CP210xVCPInstaller_x86.exe	20.11.2015 9:58	Приложение	909 КБ
cp2102.rar	30.01.2018 16:43	WinRAR archive	3 562 КБ
dpinst.xml	20.11.2015 9:55	Документ XML	12 КБ
SLAB_License_Agreement_VCP_Windows.	20.11.2015 9:55	Текстовый докум	9 КБ
slabvcp.cat	25.11.2015 18:03	Каталог безопасн...	11 КБ
slabvcp.inf	25.11.2015 17:56	Сведения для уст...	12 КБ

Type of driver distribution.

The installation process is standard.

If there is no installer in the folder (Windows 10/11), the driver must be installed through the Device Manager: By device (FlashOnline), right-click - Properties - Driver - Update driver. Next, select the folder with the downloaded drivers.

After the driver installation is successfully completed, a virtual COM port should appear in the **device manager**, if there is a connected emulator:



After installing the drivers, you can use the emulator with software.

## **Bluetooth (wireless) connection (with Bluetooth installed only)**

Wireless connection on your PC requires Bluetooth v2.0 (hereinafter referred to as BT) or higher. Connection is made in the following sequence:

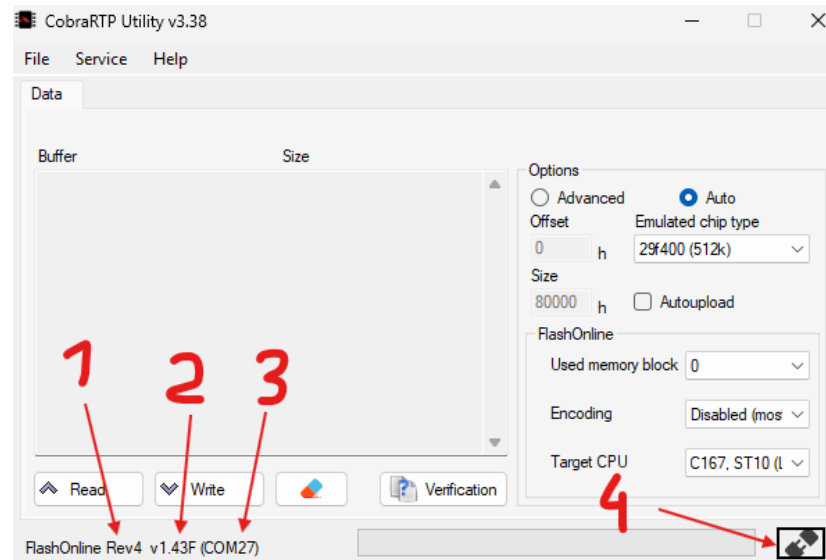
1. Connect the emulator to the ECU or via USB. At the same time, the red indicator of the BT module should blink quickly (about 3 times / sec)
2. Turn on the BT module of the PC and pair with a new device (the name is usually "*FlashOnline BT*", ", may initially be identified as an unknown device, you need to wait). Password **1234** or **0000 (Necessarily)**.
3. After successful pairing, 2 virtual COM ports should appear (see Device Manager), one of which will be used for data exchange. How correctly programs (TunerPRO RT, CobraRTP Utility) find the right port automatically if the device is turned on and ready to pair.

**Attention! When working via BT, the emulator must not be connected via USB, otherwise a conflict is possible!**

### **Notes:**

1. After each disconnection of the emulator (for example, when the ignition is turned off), in order to continue working in the software, it is necessary to reconnect (in the program).
2. Many ECUs do not de-energize immediately after the ignition is turned off, and continue to work for some time (20-60 seconds), keep this in mind, although on the other hand this is an advantage, given p1.
3. The data transfer speed via BT is lower than via USB, this is normal.

You can check the device using our software - CobraRTP Utility (<https://cobrartp.com/en/cobrartp-utility>):



1. Board version
2. Emulator firmware version
3. The number of the used COM port on which the device is operating at a given time (may differ in your case).
4. Connection button.

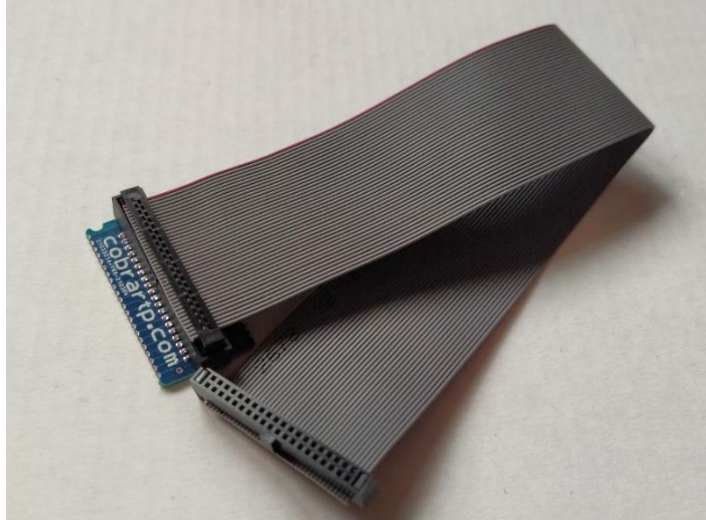
**Note: read the utility manual in the archive with the program (pdf).**

*To check and work with the emulator on a PC, there is no need to connect to an ECU! The device can be powered both from the ECU and (or) from the USB.*

**Attention! If the emulator is not recognized in TunerPRO RT, CobraRTP Utility or other software, check if the emulator is currently connected in another program! The emulator port can only be connected in one program at a time.**

## INSTALLATION AND CONNECTION TO ECU

The FlashOnline board is connected to the ECU using a proprietary adapter (SOP44 adapter) using a special cable from the kit:



Before installation, pay attention to the correct connection of the adapter (the locks must be on one side):



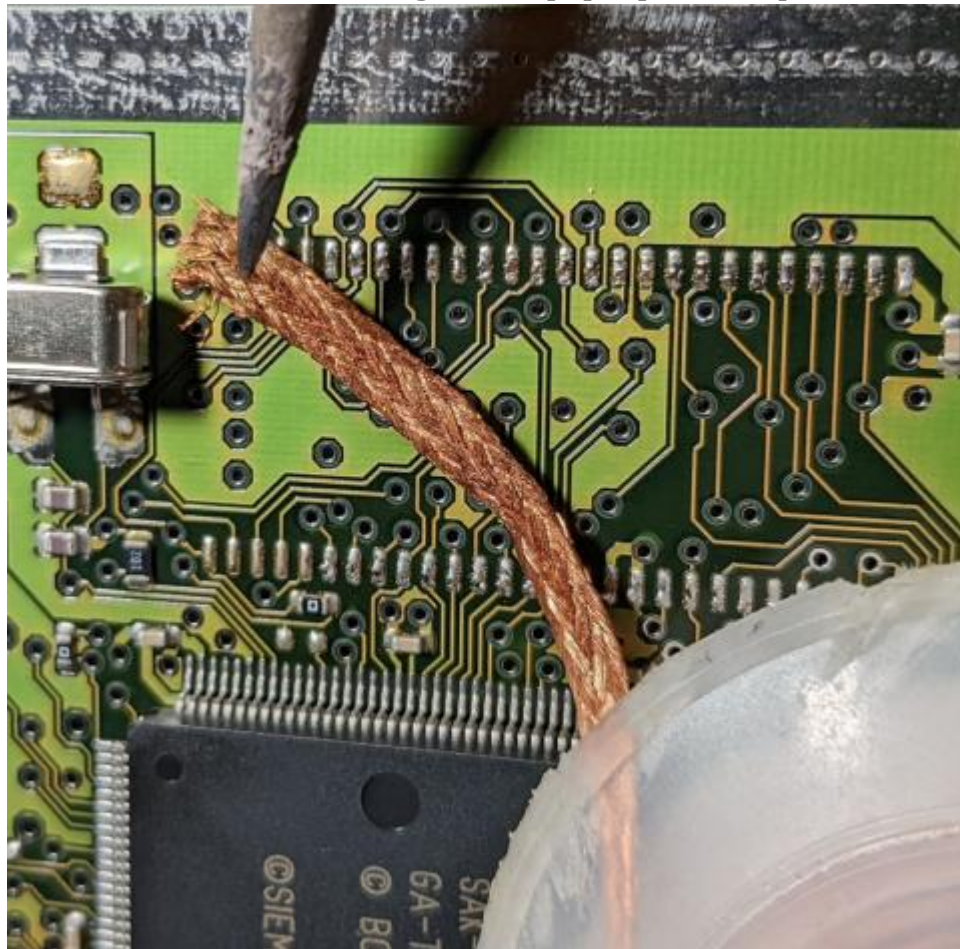
Since the device is an emulator of a memory chip, for correct operation it is required to dismantle or disconnect the standard flash memory chip from the ECU board.

### 1) Removing the flash memory chip from the ECU board

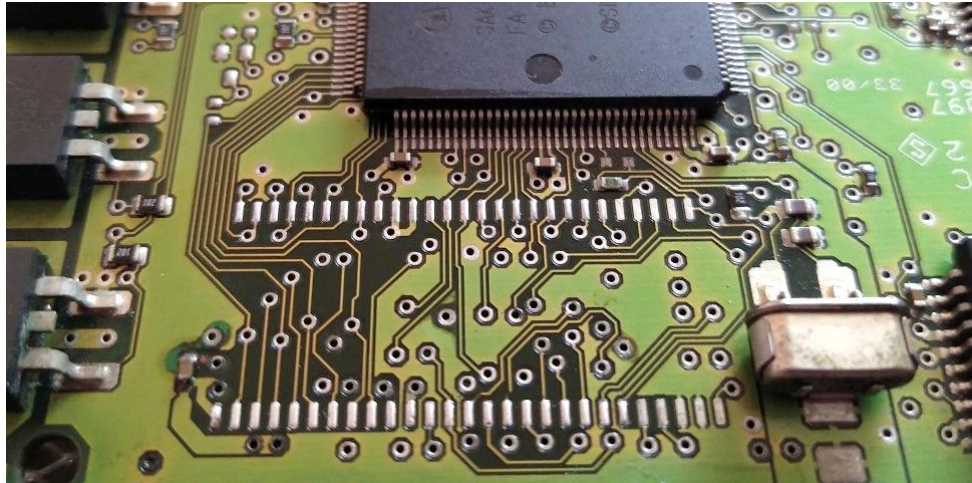
With this method, the flash memory chip must be removed from the ECU board. For this we recommend using hot air, i.e. hot air soldering station with high quality neutral flux gel. We also recommend using a board preheater whenever possible.

The air temperature at the outlet of the nozzle and the distance should be selected in such a way that the temperature of the computer board eventually reaches a temperature of 210-220°C and no more than **240°C**.

After removing the chip, prepare the pads:



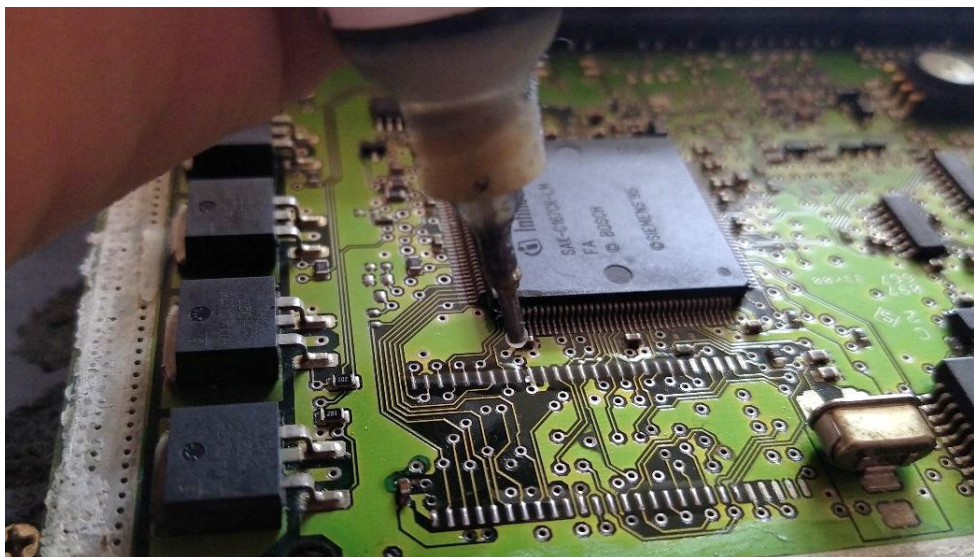
After you remove the chip, the board surface should look like this:



**ATTENTION:** be careful when removing the chip, since there is a high probability of touching and moving or completely losing other elements on the board when the melting temperature of the solder of the elements of the ECU board is reached! You should also pay special attention to the elements on the back of the board! Therefore, for these works, we strongly recommend using a special holder or a preheater of the boards.

## 2) Mounting the adapter

Remember to apply flux to the pads before installing the adapter:

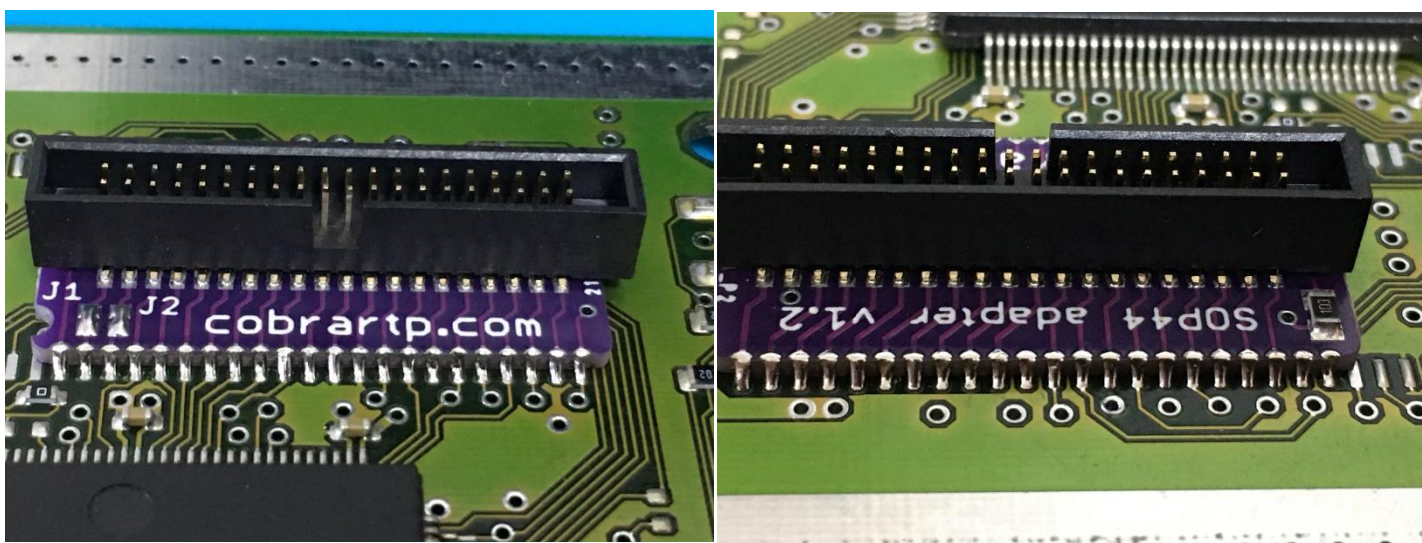


Next, you can and mount it on the ECU board.

Installation can be done in **two ways** - using hot air or using a soldering iron:

**The first method** is faster, but each heating of the ECU board and adapter negatively affects the printed circuit boards and their elements, so we recommend **the second method**, the essence of which is to solder each contact with a soldering iron.

In both cases, you should get the following:



**ATTENTION:** be extremely careful when installing the adapter in the first way, since the solder on all contacts of the adapter board also reaches the melting temperature and, accordingly, you can accidentally move or completely separate the connector (cable connection socket) of the adapter from the board! Also note that the maximum temperature of the adapter connector material is **240°C**, exceeding which the connector may be irreversibly damaged! Check, if possible, the actual outlet temperature of your hot air station. Leave the heated elements at rest until they cool completely!

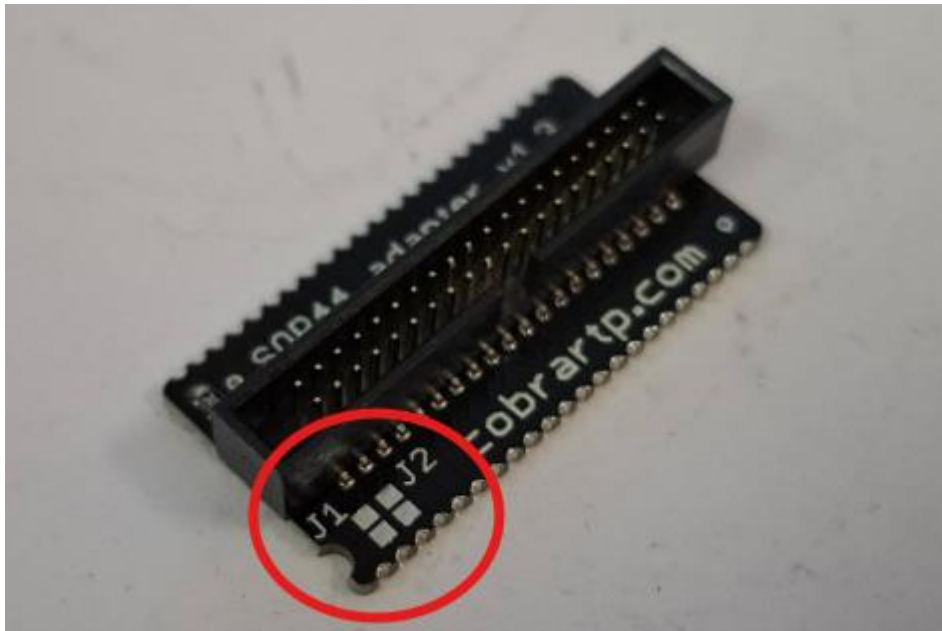
After you have done these steps, check all connections and contacts, connect the emulator using a flat cable. When the computer is turned on (the emulator should not be connected via USB), the “Status” indicator on the emulator board should light up, if this does not happen - check the correct connection and contacts. If the indicator lights up - get to work!

## Removing the adapter

The adapter is dismantled at the installation temperature, otherwise the same rules are followed as when dismantling the chip, but you should pay attention to the adapter connector, the maximum temperature of the material of which is **240°C**, as well as the fact that the solder holding the connector also melts and it can be easy to move.

**Never pull on the connector when removing the adapter! It is allowed to hold the adapter during instsall / deinstal only for a fee (base)! Heating of each side separately is also not allowed! Heat both sides of the adapter evenly!**

## CONFIGURATION JUMPERS OF THE SOP44 ADAPTER



On the SOP44 adapter board, you can see jumpers J1 and J2, which, depending on the type of memory, must be brought into compliance with the table below, i.e. solder the jumper(s):

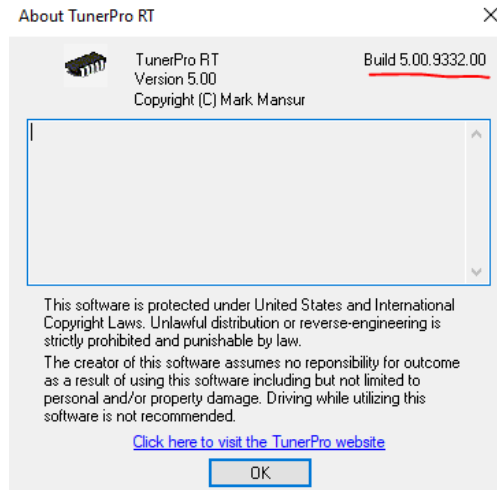
Type	J1	J2
28f200, 29f200	X	X
29F400	X	V
29F800	V	V

X - remove, V - soldered

# USING WITH PC SOFTWARE

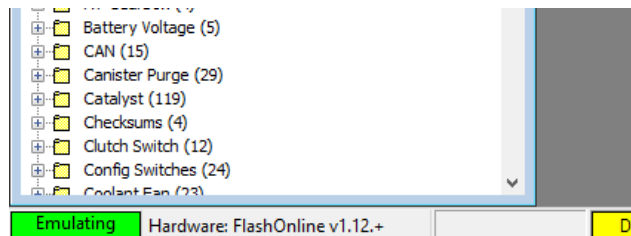
## 1) TunerPRO RT

To work with TunerPRO RT, make sure you have build version 5.00.10018.00 or higher (Help -> About...):



We recommend downloading the program from the official website: [www.tunerpro.net](http://www.tunerpro.net)

Further, if this condition is met, the device is connected, and the drivers are installed correctly, then at startup the program will automatically detect the device:



After that the program is ready to work.

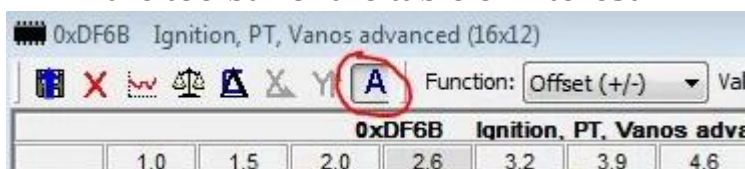
We recommend that you study our article on using TunerPRO RT: [https://cobrartp.com/en/online tuning](https://cobrartp.com/en/online_tuning)

**Attention! If the emulator is not recognized in TunerPRO RT, check if the emulator is currently connected in another program! The emulator port can only be connected in one program at a time.**

## Address (tables) hit tracking

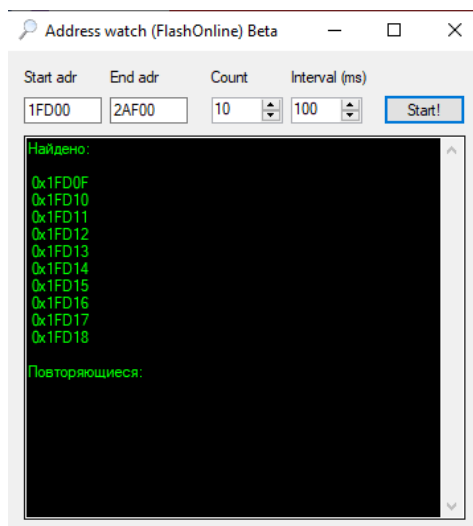
Hardware tracing is a feature that allows you to track which areas of memory the ECU processor is accessing without using any third-party hardware. In other words, you can observe the coordinates in the maps of interest, according to which the ECU is working at a particular moment in time. To accomplish this, this function is supported in TunerPRO RT, as well as in CobraRTP Utility with v2.8 (Address watch function).

To enable this function in TunerPRO RT, use the corresponding button on the toolbar of the table of interest:

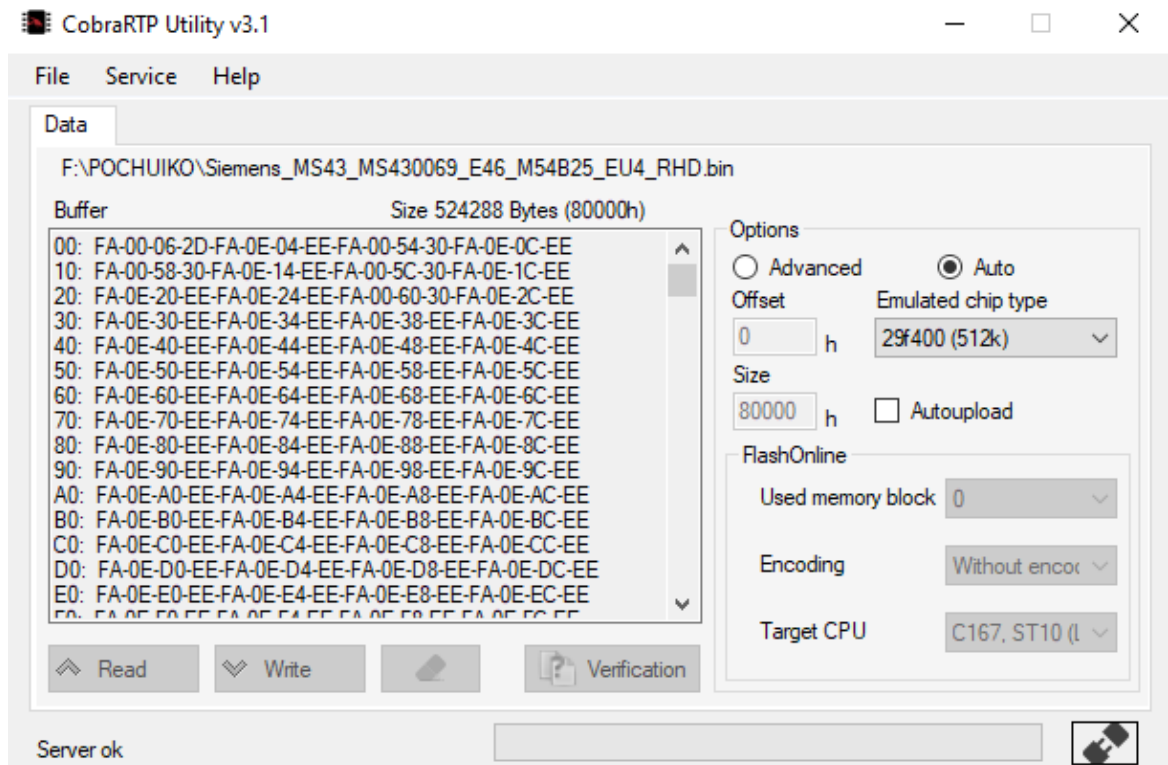


**Note:** you may not see the pointer (yellow cell) in selected table at the expected time. This does not mean that this function is not working correctly, it means that the ECU processor does not access this table (address range) at this time. It is also possible that table is not used at all during normal engine operation, such as cranking cards ant etc.

Call Address watch, i.e. tracing the addresses by which the ECU processor accesses a given address range (memory area). It works on the principle of the table trace function in TunerPRO RT (**for more details, see the manual for CobraRTP Utility**):



## 2)CobraRTP Utility



This is a proprietary utility for working with CobraRTP emulators, incl. and with FlashOnline since version 2.7. Allows you to load (read) firmware into the emulator, check and download firmware updates, configure the device, check the operability and other.

**A detailed manual is contained in the archive with the program.**

More information, as well as download the latest version of the program:  
<https://cobrartp.com/en/cobrartp-utility/>

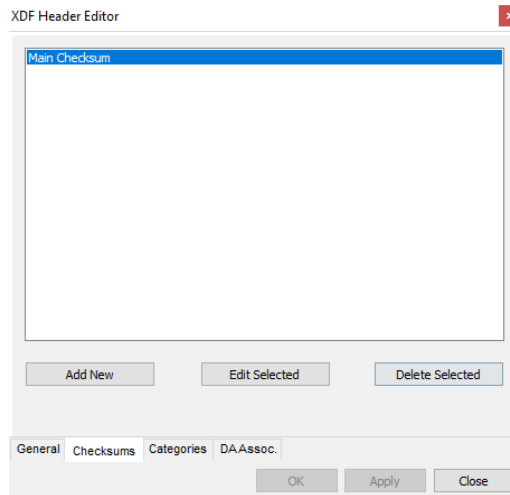
## 3) Other software

You can use other firmware editors, for example WinOLS, RomRaider, ECM Titanium, etc., which save the firmware in binary format (.bin), and then upload the firmware via CobraRTP Utility. With the powerful "Autoupload" function, the firmware will be automatically loaded online when its file is changed, i.e. after saving (overwriting) the file to disk. (more in the CobraRTP Utility manual).

## GENERAL NOTE ON USED FIRMWARE

1. For the emulator to work, you need to download the full ECU firmware (256-1024kb) at least once for a specific ECU, then you can change (upload) only individual maps, tables, parameters (calibrations) of the firmware online in TunerPRO RT, WinOLS, RomRaider, etc. and, accordingly, there is no need to download the firmware completely every time, for this there is a " Autoupload " function in our utility, or, if you use TunerPRO RT, the maps are loaded from the program itself online (See. [нашу статью о TunerPRO](#)).

2. Check if you need to correct the checksum for a specific firmware (ECU), as well as when editing the firmware for writing to flash memory! FlashOnline does not correct the checksum! In TunerPRO, you can check this in the XDF edit section:



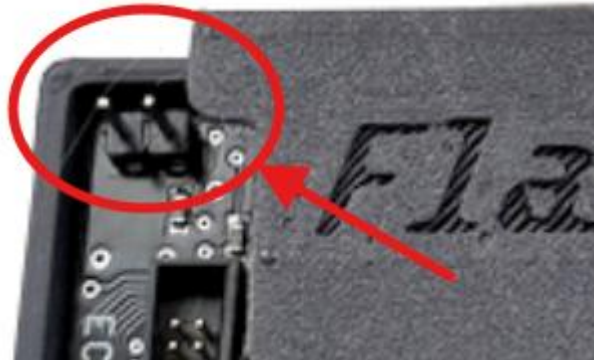
3. Use firmware 100% compatible with your ECU and only complete, not calibrations (the emulator performs the same role as the chip that was uploaded - it will work!). Ideally, the firmware can be downloaded via the OBD connector from the ECU with which you will use FlashOnline.

4. After downloading the full firmware, many ECUs require a complete restart, at least by turning off the ignition. In this case, the emulator does not need to be restarted, turned off, etc.

## DUAL-MOD FEATURE

Dual-mod is an additional function that allows you to upload several independent complete firmwares to the emulator, then switch online.

For this purpose, the FlashOnline board has corresponding contacts, upon closing or opening of which the corresponding memory block of the emulator is selected (firmware):



Dual-mod works only when emulation of 28F200, 28F400, 29F200, 29F400, i.e. with firmware 256-512kB, because FlashOnline total memory is 1024kB (100000h) or 2 blocks of 512kB each. **When emulating 29F800, this function does not work.!**

To select a memory block into which the firmware will be loaded, you must install in the utility:



### Selecting memory blocks (switching) on the FlashOnline board:

Block 0 - contacts open

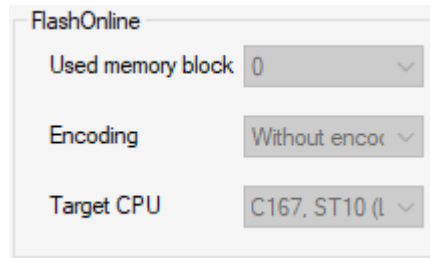
Block 1 - contacts closed (jumper installed)

*By default, memory block 0 is selected and the contacts are open accordingly; the emulator is shipped in this state.*

**Note:** In TunerPRO, only memory block 0 is used by default. Therefore, for full use of the dual-mod with TunerPRO, save the firmware (bin) and load them through the CobraRTP Utility already with the ability to select memory blocks.

## ECU COMPATIBILITY OPTIONS

These options are intended to make the emulator compatible with different ECUs. These options are responsible for representing data in the emulator's memory chip:



1. Encoding - decides the compatibility with the ECU, where the flash memory data bus is connected non-standard. As a rule, this is a Siemens ECU. This option must be enabled if your ECU is on the list.

2. Target CPU - responsible for the data byte order system. To date, there are several byte endianness systems for 16 or more-bit CPUs: Little-endian and Big-endian. In most cases, Little-endian is used, but Big-endian is also found in the ECU when **Motorola** processors are used, such as **Siemens MSS52-54**. The option is available starting with firmware version 1.30 and CobraRTP Utility v3.10. But if the firmware was read by the programmer directly from the chip, then it may already be interpreted from Big-endian to Little-endian, and thus, there is no need to enable the “Motorola (Big-endian)” mode.

“Play around” with these settings if you're not sure.

The default settings (**without encoding** and **C167/ST10** CPU) are suitable for most popular ECUs, such as:

**Siemens** MS41.0, MS41.1, MS41.2, MS42, MS43.

**Bosch** ME2.8, ME3.8.3, M5.2.1, ME7.x, EDC15 (P/P+/C4/C6/VM).

### Notes:

- **If these options are selected incorrectly, then the ECU will not work with FlashOnline.**
- **After changing any settings in this window, you need to download the firmware again.**

## FLASHONLINE USING NOTES

1. FlashOnline can only work in read mode, i.e. there is no hardware ability to program the emulator via the ECU as well as the chip (for example, via the OBD2 connector)! Data can only be recorded via the USB interface of the device. In this regard, for ECUs that use flash memory to record calibrations (adaptations) in normal ECU operation, data will not be written to FlashOnline.

2. FlashOnline can be installed and used instead of the memory chip on a permanent basis, but it should be borne in mind that the CR2032 3V battery installed on the device board serves to power the volatile memory, which stores the firmware (s) when the device is turned off. Accordingly, the charge of this element is sufficient for 2-5 years. After the cell is discharged below 2V, the data in the memory will be corrupted after each power outage.

3. Dual-mod function only works in emulation mode 29f200 / 28f200, 29f400 / 28f400 (256-512kB), and is not supported for 29f800 (1024kB).

4. FlashOnline does not calculate the checksum, data does not change spontaneously in the emulator memory.

5. Check for updates using CobraRTP Utility as often as possible. When accessing the network, the program itself will offer updates if necessary.

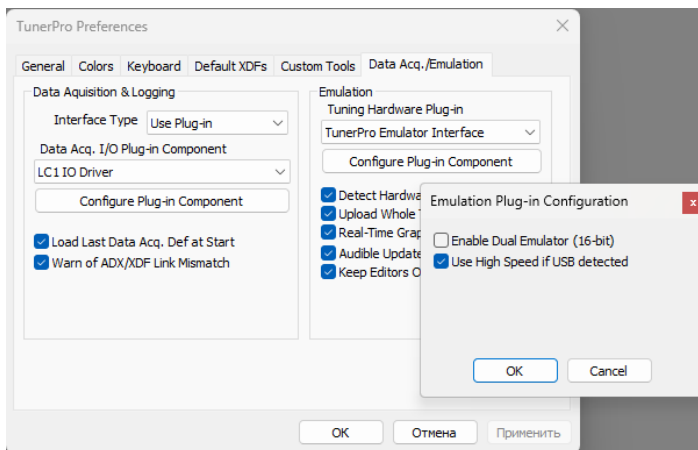
# TROUBLESHOOTING

## The engine will not start and the ECU does not response via OBD2

- Check whether the firmware is compatible with your ECU, the firmware must be a match of the size of the ECU flash memory
- It may be necessary to perform actions with configuration jumpers (see page 12)
- The wrong memory block of the emulator (DualMod) may be selected
- check the compatibility settings in CobraRTP Utility for your ECU (see page 18)
- When loading the firmware via CobraRTP Utility, the wrong type of emulated memory was selected (see options in CobraRTP utility)
- Check all contacts and connections of the device with the ECU, check the soldering quality of the SOP44 adapter or replace adapter.

## Emulator is not recognized in TunerPRO RT

- You may be using TunerPRO instead of TunerPRO RT.
- Make sure that the emulator is not currently connected in other software, such as CobraRTP Utility.
- Check if you have the latest version of TunerPRO RT on the *tunerpro.net* website.
- Check that the emulation settings match the path *Tools – Preferences – Emulation*:



## Tracing does not work in TunerPRO RT

1. Perhaps you have selected an inactive map (see page 14)
2. Check if Memory Block 0 is selected in DualMod
3. Make sure the XDF file matches your firmware (bin).
4. Make sure your FlashOnline firmware version is v1.30 or later.

## **When loading changes (new table values), nothing changes in the ECU operation**

- Check if Memory Block 0 of DualMod mode is selected in case of TunerPRO RT.
- Check if the corresponding memory block is selected according to the DualMod jumper selected in case of other software.
- Make sure that the XDF file matches your firmware (bin)

## **An error appears when upload/download data**

1. If an error occurs during the download/read process - replace the USB cable.
2. If the error occurs only in TunerPRO RT, and in CobraRTP Utility the data exchange with the emulator is fine, check if the bin file parameters are specified correctly in the XDF settings - Bin size (HEX) and offset, It's must be equal to the size of the bin file and divided by 2. For example: if file size is 512kB, then it should be 80000.
3. If you use Bluetooth pairing, do not forget to connect again in the program after turning off the emulator (ignition).
4. If the problem persists, contact technical support.

## **After turning off the emulator for a while, the car stops starting, although it did start before turning off**

Check the backup battery (CR2032), the voltage in the disconnected state should not be lower than 2.0V. Replace the element. This issue may also be due to an incorrect checksum.

## SPECIFICATIONS

Supply voltage	4.7 - 5.5V
Backup battery voltage	2.0-3.3V
Supply current	70mA
Ambient temperature	-20... 50°C
Maximum Bluetooth Range	10m
Weight	60g