

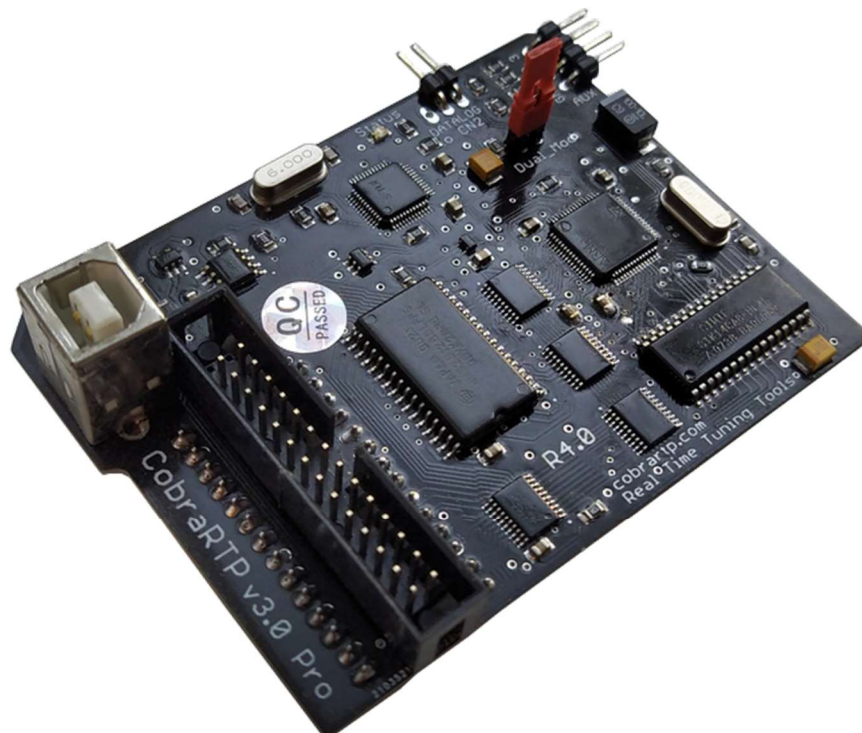


# CobraRTP

**V3.0 Pro**

User manual

Rev. 1.2

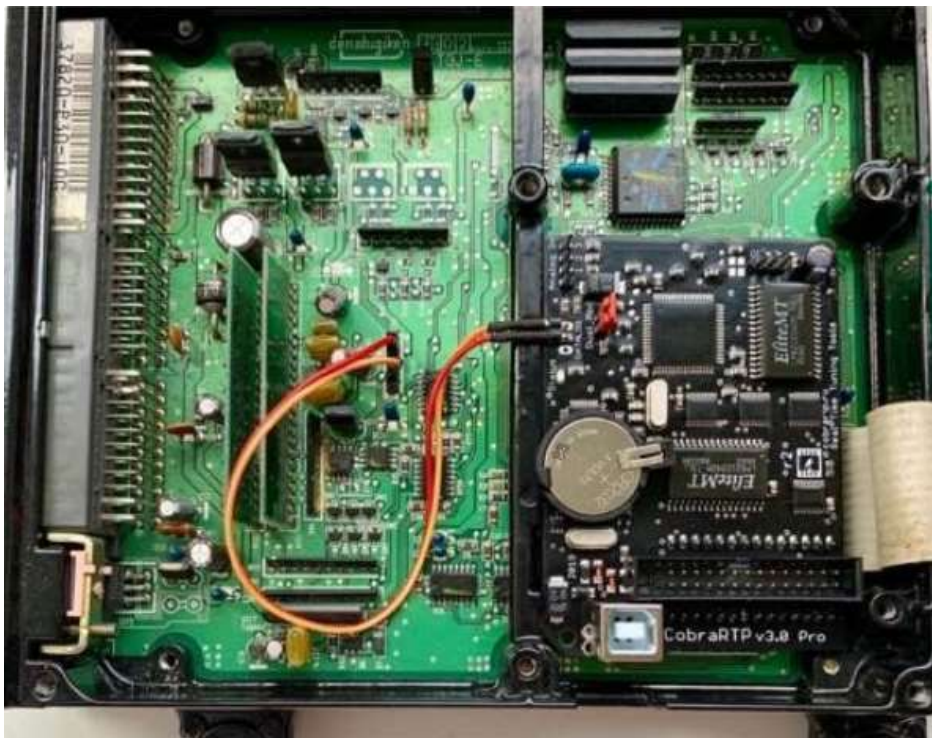


---

## Installation

Method 1 - direct installation in the ECU. . (not actual for PCB rev R4.0+)

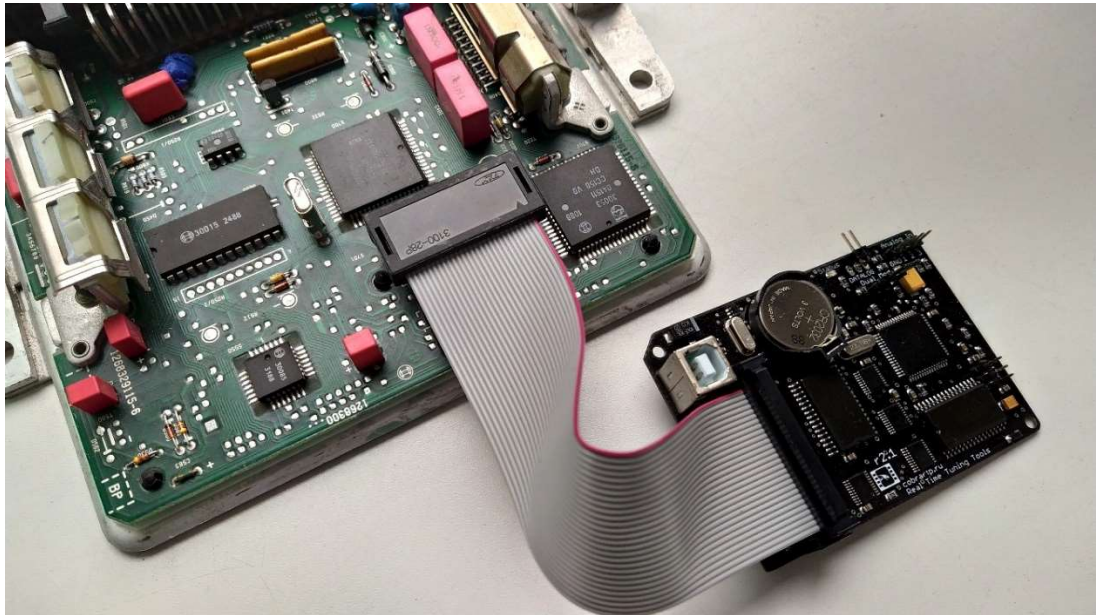
With this method, the installation of the CobraRTP board is carried out directly in the chip socket. This method is preferred if there is sufficient space in the computer case. For reliable contact, the CobraRTP board and the ECU board must be parallel to each other. This method is used for Bosch Motronic ECUs (173, 179, etc.) and etc)



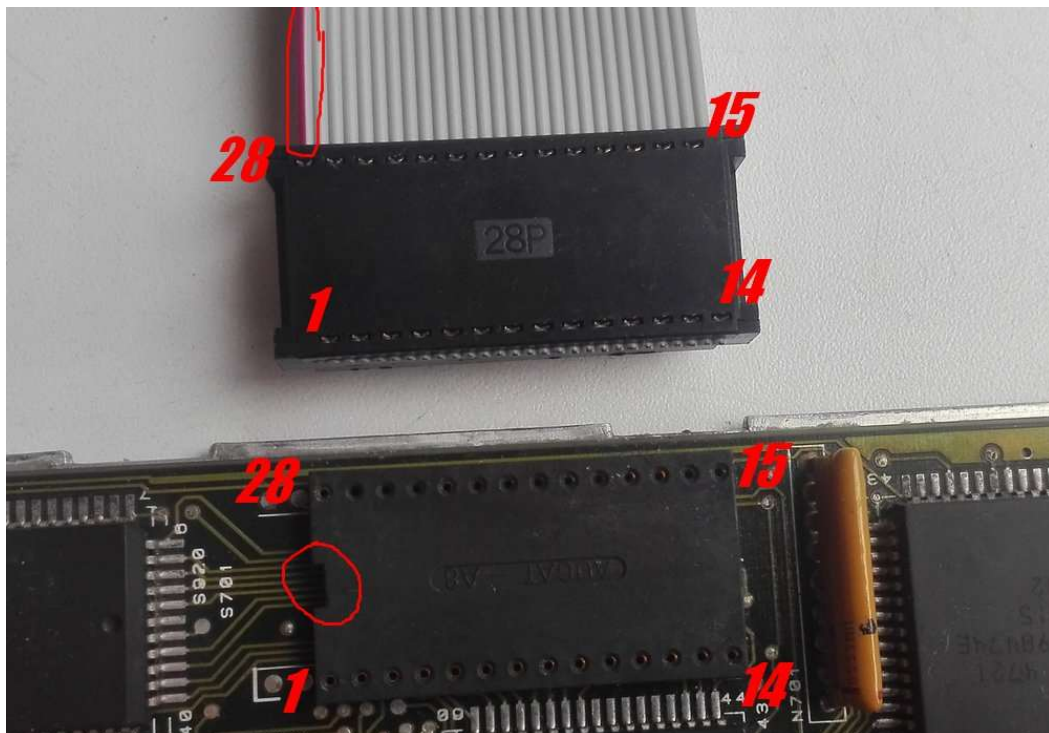
---

## Method 2 - using a Socket extension cable.

This method is used for most ECUs.



Correct connection must be observed as shown in the figures below:



**In all cases, it is necessary to navigate the red strip on the loop cable and the cutout on the socket, which should be on one side!**



---

If connected correctly, after on ignition, the “Status” LED on the MotronicRT board should light up.



**Warning: Attention:** since the device does not have a protective case, when the state is switched on outside the ECU case, it is highly recommended not to touch unprotected current-carrying sections of the device board! Also, when installing in the ECU case or on other metal elements, it is necessary to isolate the contact points!

Datalog (**Honda / Acura only**) is connected to the ECU (CN2 connector) using the cable provided, as shown below:



As you can see, two data lines are used for connection - **RX** and **TX**, respectively **2** and **4** pin of the **CN2** connector in the computer.

This is true for USDM, EDM and JDM region.

---

## Connection to PC

Connect v3.0 Honda Edition to a PC using a standard USB type-B cable.

CobraRTP can only connect to a PC, i.e. There is no need to install (connect) the emulator to the ECU, or connect a separate power source.

### ***Connection setup***

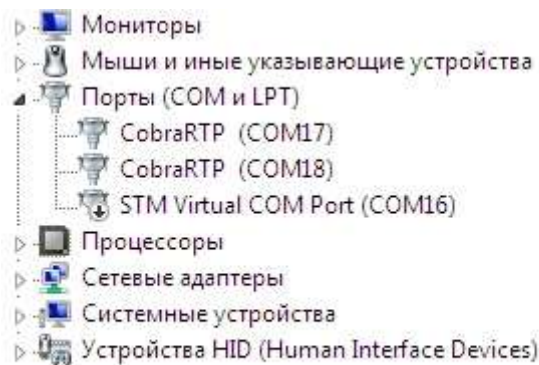
After connecting, you should have a new device in the device manager. After that, you need to install USB drivers.

Drivers is necessary be downloaded on our website:  
<https://cobrartp.com/en/downloads>

### ***Setup USB-Drivers***

Installing USB drivers is standard. To do this, you must run the file "*Setup v3.0 USB Driver.exe*" and follow the instructions(3).

After successful installation of the driver, in the device manager, if there is a connected emulator, two virtual COM ports should appear:

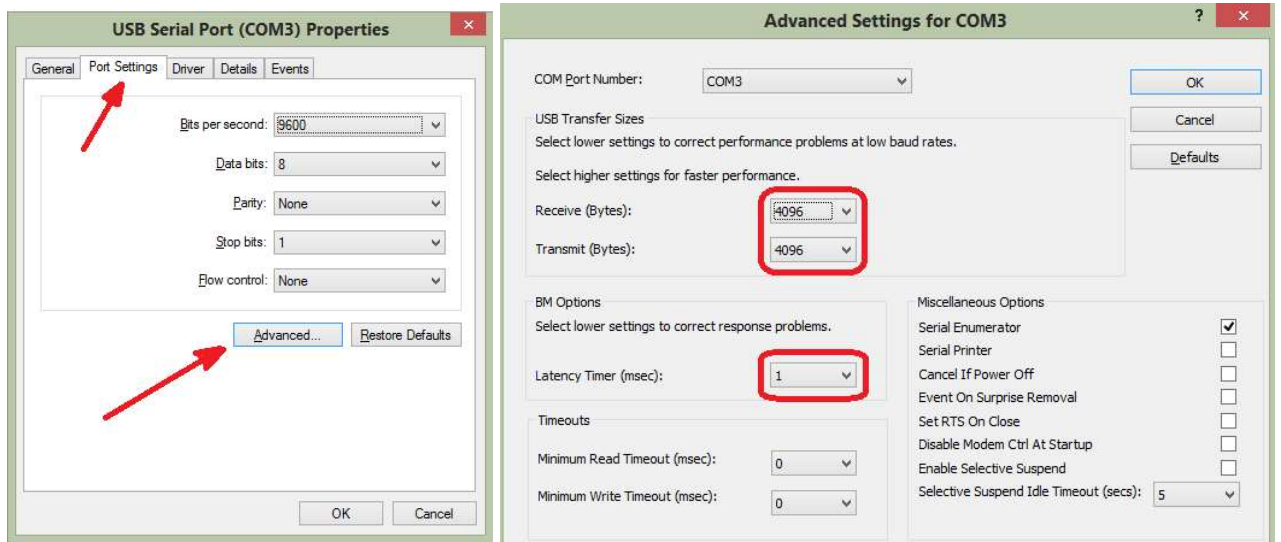


*View of the device in the device manager upon successful installation of the driver (port numbers may differ from yours).*

### **Notes:**

1. one of the COM ports is used for **RTP (emulation)**, the second, respectively, for **Datalog**. It is possible to determine on which port the emulator (RTP) is used, using the CobraRTP Utility (see below).

2. If for some reason the standard drivers were installed (auto-update), then for stable operation of the system it is necessary to specify the following parameters in the port properties:



This operation must be performed for both COM ports.

Or reinstall the driver using the official drivers from our website (described above).

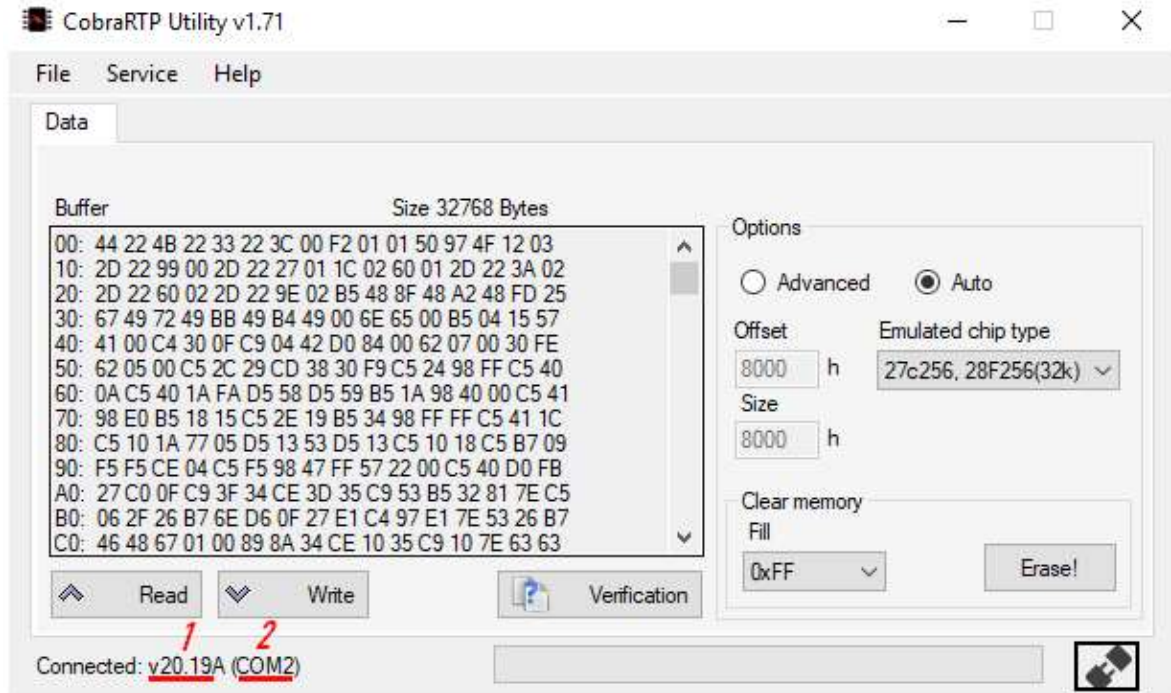
3. For successful installation of drivers it is strongly recommended to disable anti-virus software.

---

## Check connection

To test the CobraRTP device, you can use **CobraRTP Utility**.

You can download the latest version on our website in the "*Downloads*" section. The number of the required COM-port for emulation (RTP) will be selected automatically and displayed in the status-bar of the program:



1. – emulator software version.
2. – the number of the active (used) COM-port (for emulation).

Accordingly, the second added COM-port number when connecting the device will be used for **Datalog**.



---

## Status indicator

The CobraRTP board has an LED indicator for the current status of the emulator "Status":



### Modes:

#### 1. Battery life:

At the first power supply, the indicator lights up and is constantly lit during operation..

#### 2. Tuning:

When the emulator is connected to the software, the indicator will go out, and it will only light up again during identification, read, write, and verification operations..



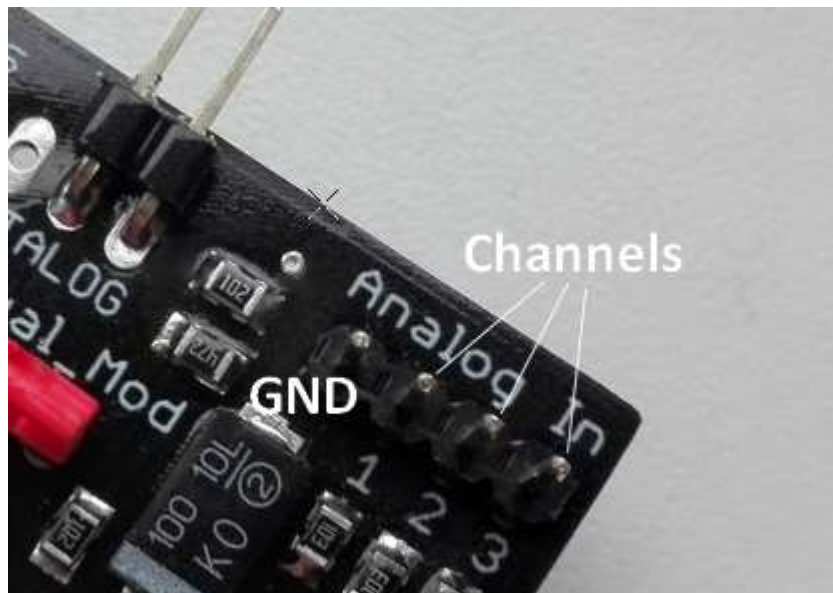
---

# Analog In

There are 3 universal analog inputs on the CobraRTP Pro board that are designed to input analog signals (voltage) into the software, currently TunerPRO RT and CobraRTP utility.

Signals can be connected from three independent sources, for example: throttle position sensor (TPS); from the analog output of the controller of a broadband oxygen sensor (AFR); mass air flow sensor (MAF) and from other sources of analog signals with an output voltage in the range **0-6V**.

## Input Assignment

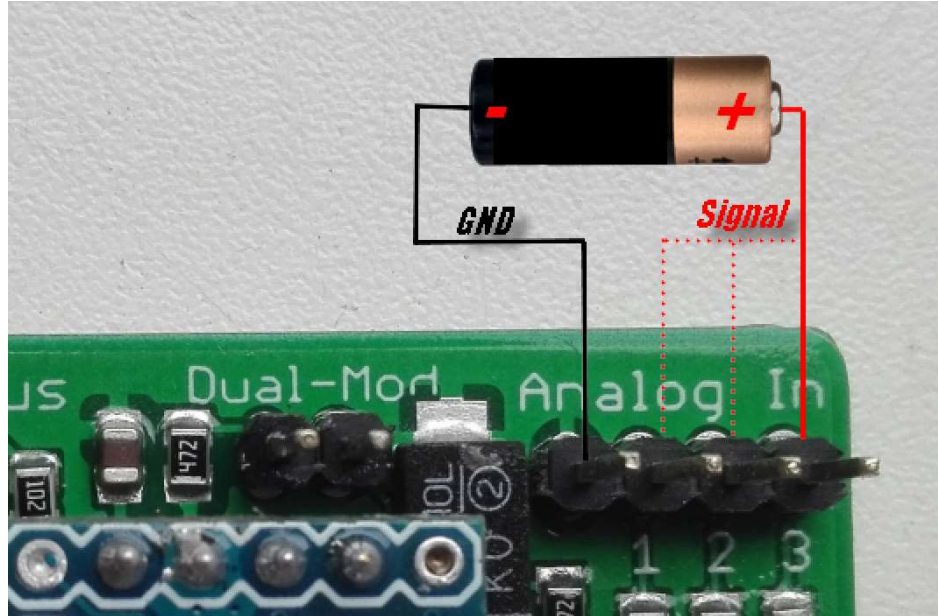


1. **GND** – common conductor (-). Designed to connect the common point of all connected sources. It may not be necessary if the sources are vehicle sensors, but it is recommended to use it for better communication and noise immunity.
2. **Channel** – inputs for connecting analog signals (channels 1, 2, 3). These are directly the analog inputs to which the signal conductor of the source is connected.

## Checking Analog Inputs

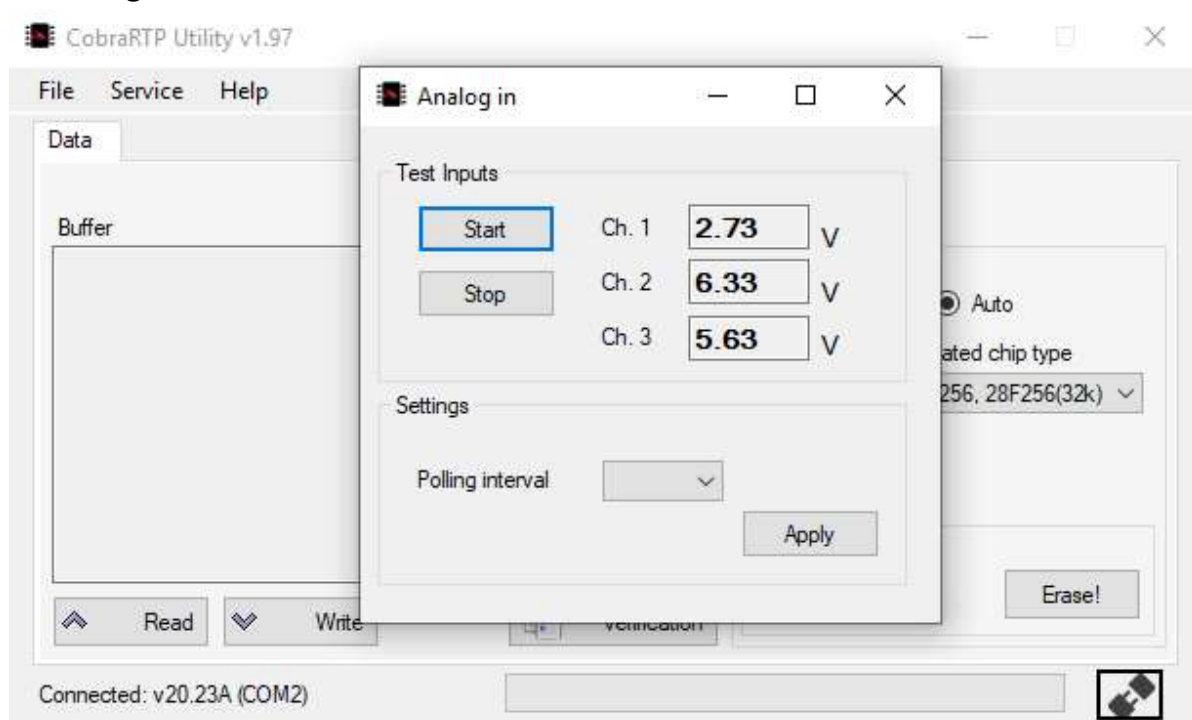
To check the analog inputs, you can use a battery (battery) with a nominal voltage of 1.5 - 3.7 V.

The source should be connected as shown below:



The signal conductor (in this case +) can also be connected simultaneously to all 3 channels.

Further, to display signals (voltage), you can use the CobraRTP Utility. To do this, open the utility, connect to CobraRTP (see the manual), go to the "Service" -> Analog in -> Start:

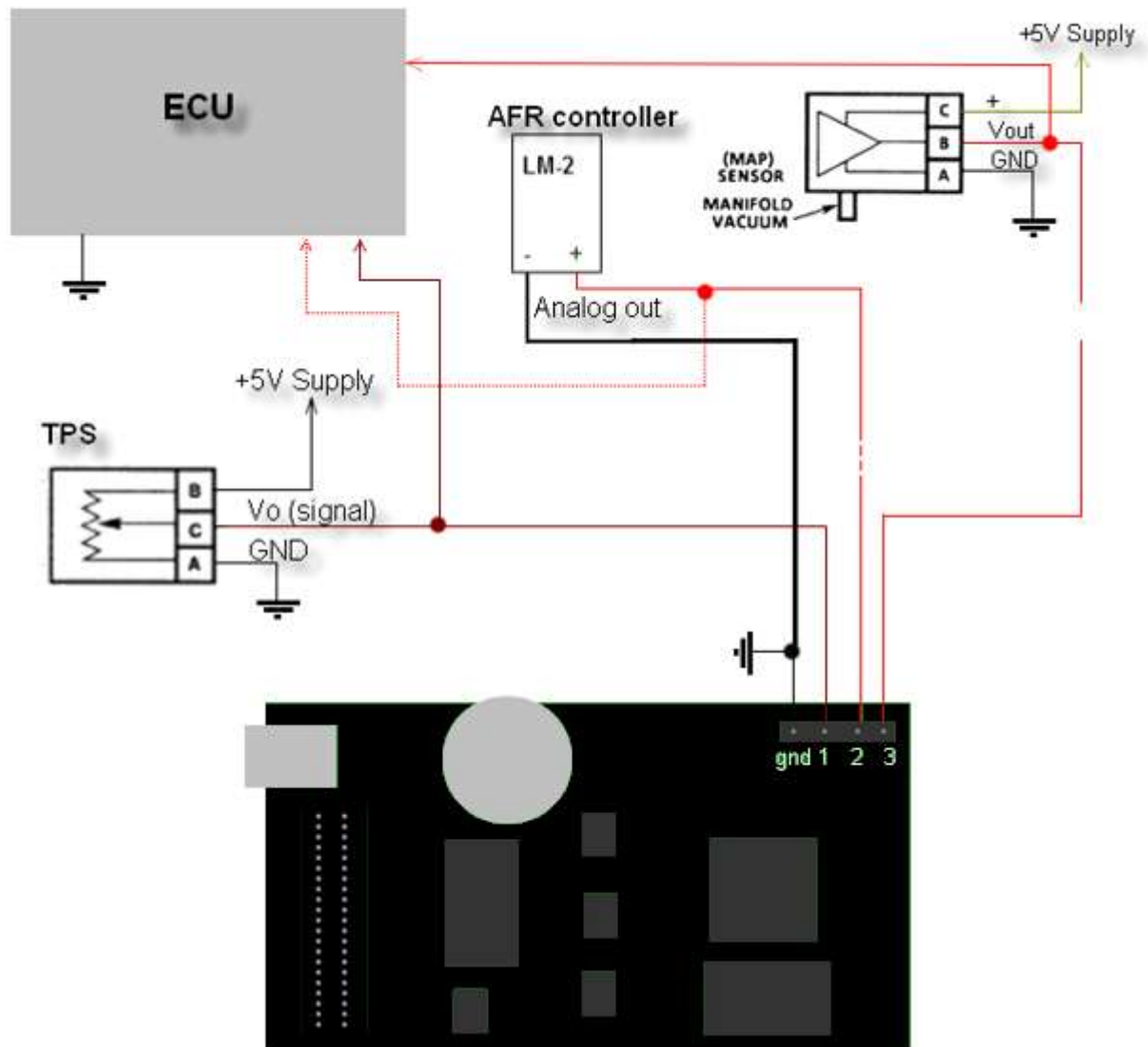


---

After that, the current voltage of each channel in real time should be displayed in the output windows of the corresponding channel.

Here you can change the sampling (polling) interval of analog inputs, which affects the speed of signal processing, which can correspond to 70, 130, 300 ms.

**For example (test application):**



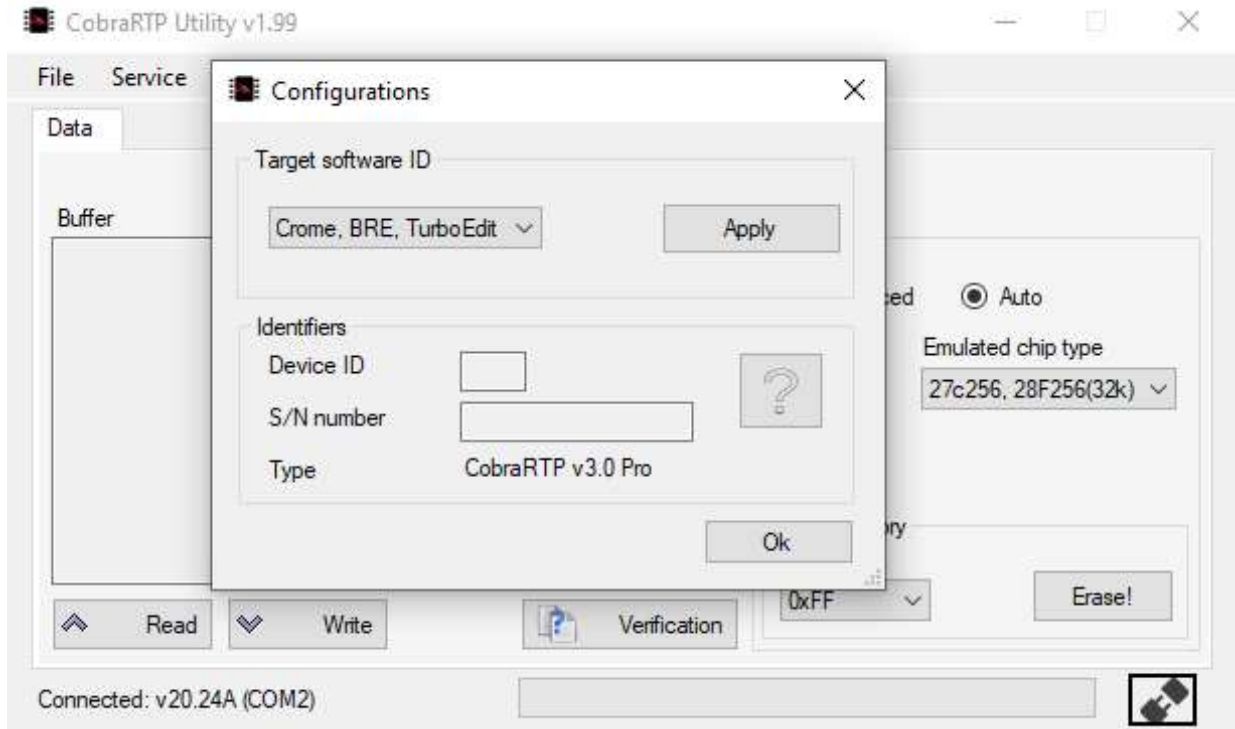
**Note:**

1. Dashed lines are optional.
2. All names of conductors (terminals) may differ from real ones.
3. Analog inputs do not support pulse signals (speed sensor, RPM sensor, etc.)
4. This function (data Acquisition from analog inputs) is not related to tracing!

---

# Software setup

**Before running the emulator in TunerPRO, Nistune, eCtune, HTS, Crome, BRE or TurboEDIT, you must make sure that the current target software ID corresponds to the program you intend to use (see CobraRTP Utility):**



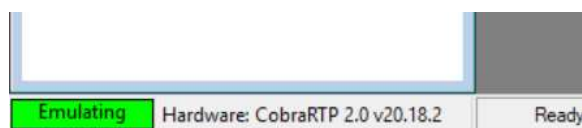
To change, you must select the appropriate software in the list and “Apply” (at a time).

**Always download the latest software.**

## TunerPRO RT

No installation is required for connection to **TunerPRO RT**. When connecting, the program itself determines the necessary connection settings (if the device is available for connection).

After successful connection, the following message should appear in the program status:

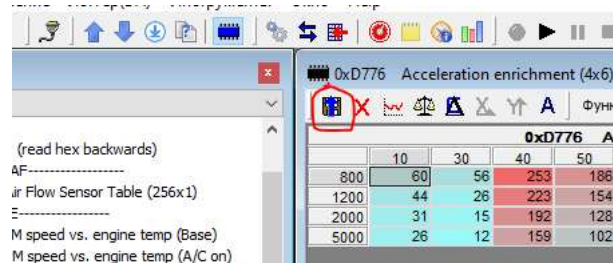


After this, the emulation mode is configured and you can perform tuning online. To enable online mode, use the button:



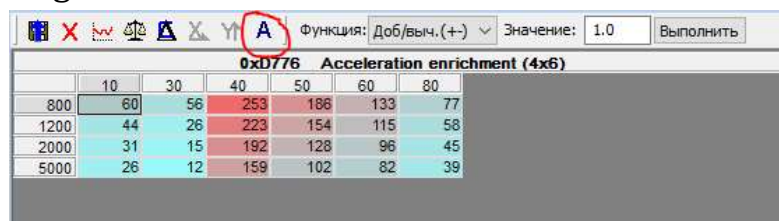


After that, to download changes to maps (tables), there is no need to **download the entire bin**, for this you can use the following button:



## Address hit tracing

Data tracing in TunerPRO RT will allow you to track what data in tables (memory cells) the ECU processor is accessing. This is achieved without the use of additional equipment, for this it is enough to open the table (map) of interest and enable tracing:



After that, a yellow cell appears on the map, which indicates which data cell on the map is currently being accessed by the ECU control program.

### Notes:

-Tracing may not work on some maps at the expected point in time. the processor does not always refer to the data area of interest (map) in a given operating mode of the control system.

-For Bluetooth version, after turning off the ignition switch, you need to reconnect to the device in the software and re-connect the trace.

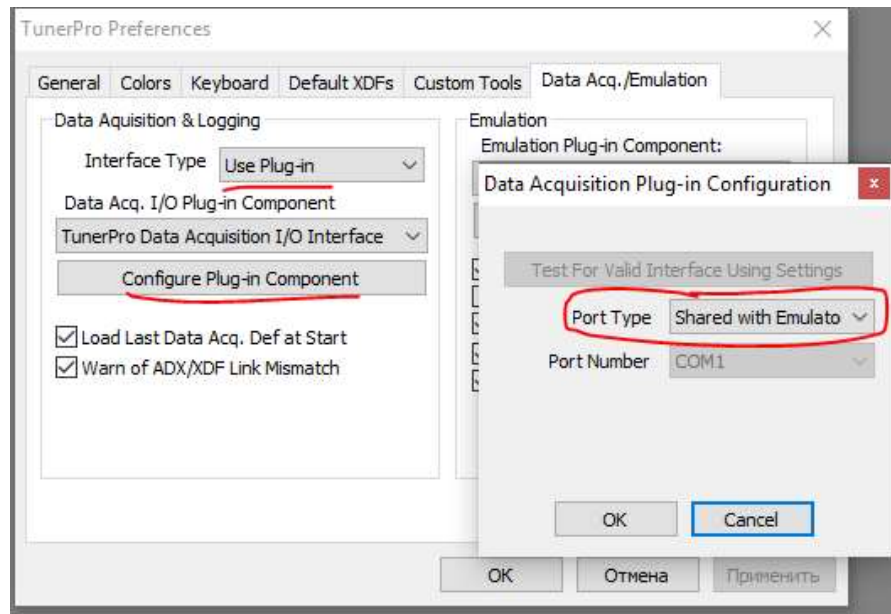
- Trace is additional optional and does not guarantee 100% performance of expected results.

---

# Configuring and Establishing a Data Acquisition System Connection with a Device (for Analog in working)

## 1. You must install the port of the data acquisition system (DA)

This port must match the emulator port, for this you need to go: *Tools -> Preferences:*



## 2. Select definition file (ADX)

At this step, you must open the definition file that we provide specifically for CobraRTP devices (<http://cobrartp.ru/en/downloads>).

To do this, go to: *Acquisition -> Load definition file.*

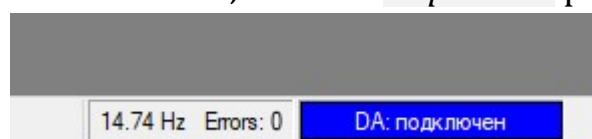
After successfully downloading the definition file, the DA system is ready to connect and directly to write parameters from the device inputs.

## 3. Turning on the logger (DA)

To enable / disable the logger, use the button on the toolbar:



If the connection is successful, the data *acquisition* process will begin:

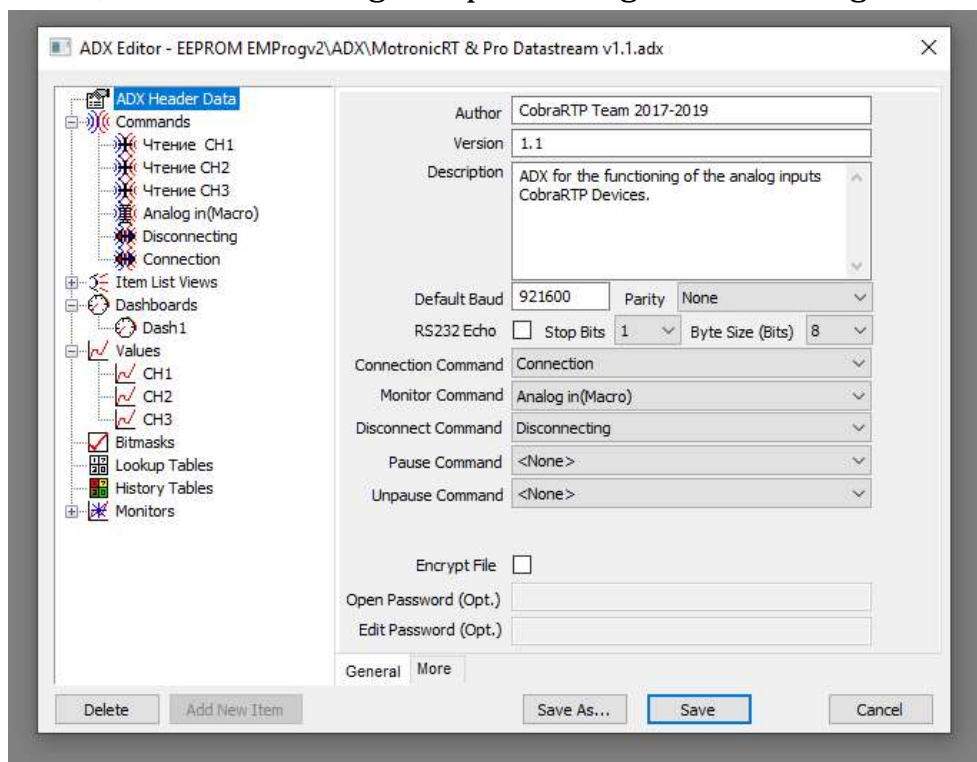


These tools are used to display virtual instruments (Data dash), graphs (Data monitors), a list (Data list), and also to record (play) logs:



## Editing a Definition File (ADX)

The definition file is a description of the data exchange protocol between the device and TunerPRO, connection settings, a list and value of parameters, a dependency that determines the conversion of received data into a convenient form and units, and other settings for processing and collecting the data stream.



To open the editor, press the button:



## Defining the dependence of output on input data

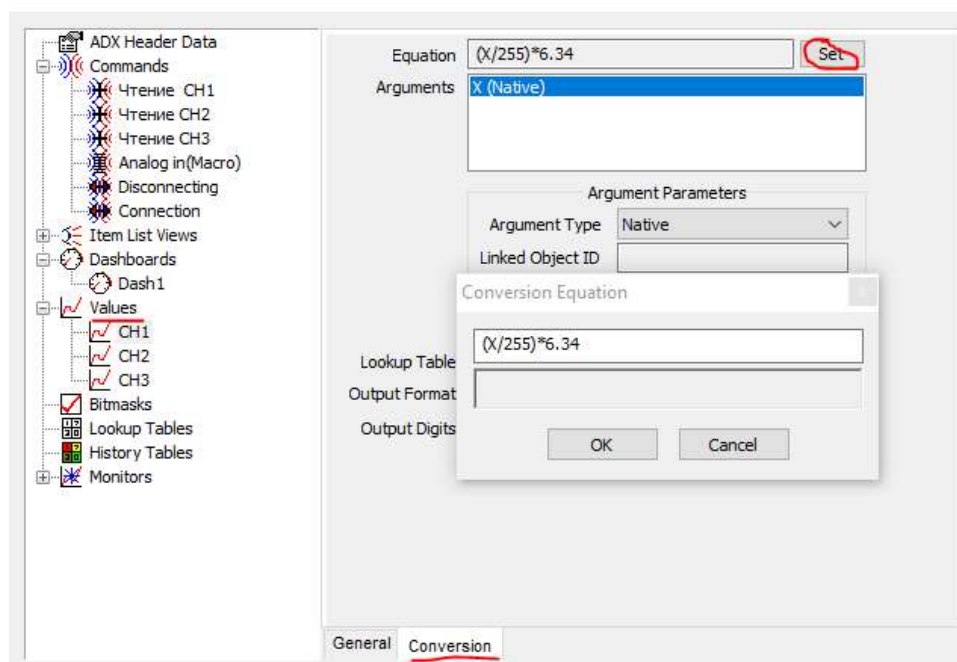
To convert the data stream from the device (in this case, from the analog inputs) in the ADX file, it is possible to set the dependence of the output data on the input in the form of a mathematical formula.

Data from the device is a stream of bytes (code), the value of which varies from 0 to 255, depending on the magnitude of the input voltage.

The dependence of the code on the value of the input voltage on the "Analog in" is linear:

Voltage (V)	Output value(X)
0	0
6.34	255

To change the dependence (formula), you must go to: Value. -> select the corresponding analog channel (CH) -> Conversion -> Set:



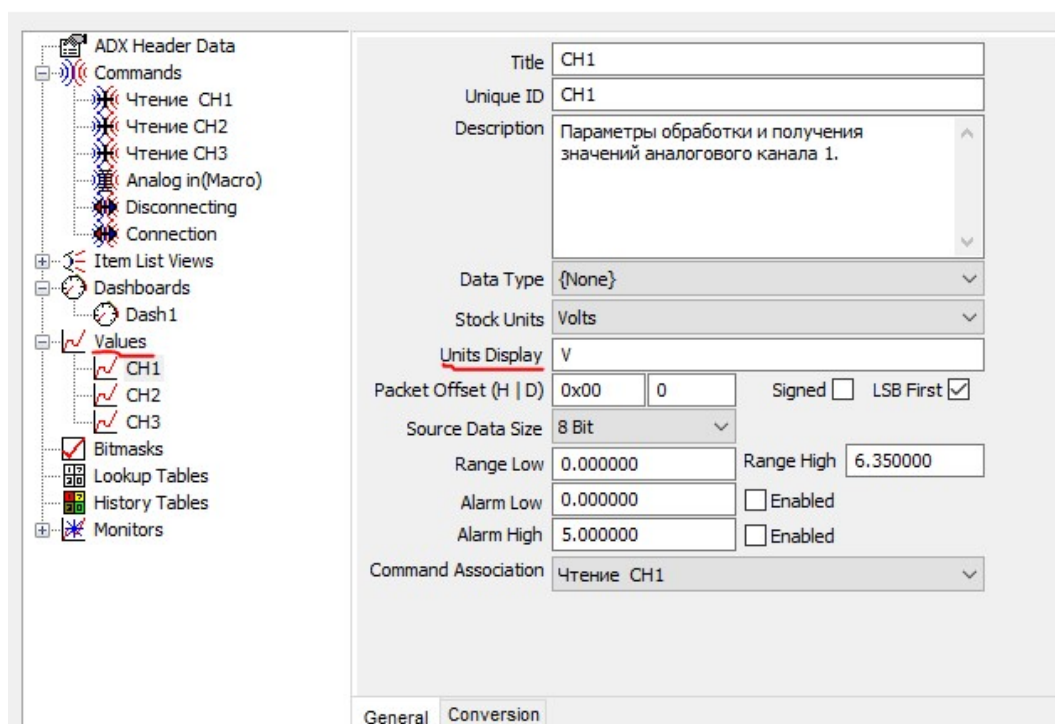
The input argument is the variable "X", which takes the values of the input data stream (bytes) and can vary from 0 to 255, respectively. Thus, the given mathematical formula can change the dependence of the output data on the input. In the initial case, voltage conversion (V) is used by default, but you can set your own dependence, for example, to obtain the absolute position of the throttle in %.



---

## Change displayed units

Also, for convenience, you can set any units displayed on virtual devices. Also here you can set the boundaries of the range of displayed values. To do this, go to:



You can find details of other parameters in the program's help (*Help menu*).

### Notes:

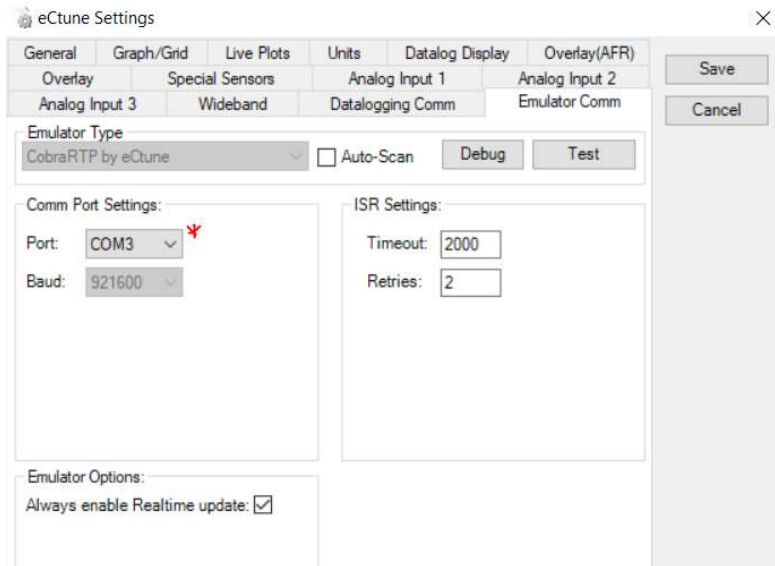
1. When uploading firmware (full) to Emulator, it is advisable to disable tracing.
2. The collaboration of logging (DA) and online mode may not be compatible, especially with large amounts of data.
3. To work with the firmware, it is recommended to use the online mode, i.e. partial change of tables (firmware). No need to upload all firmware after changing tables (parameters).

---

# eCtune

Download the prepared version on our website in the "Downloads" section. Open the program (eCtune.EXE).

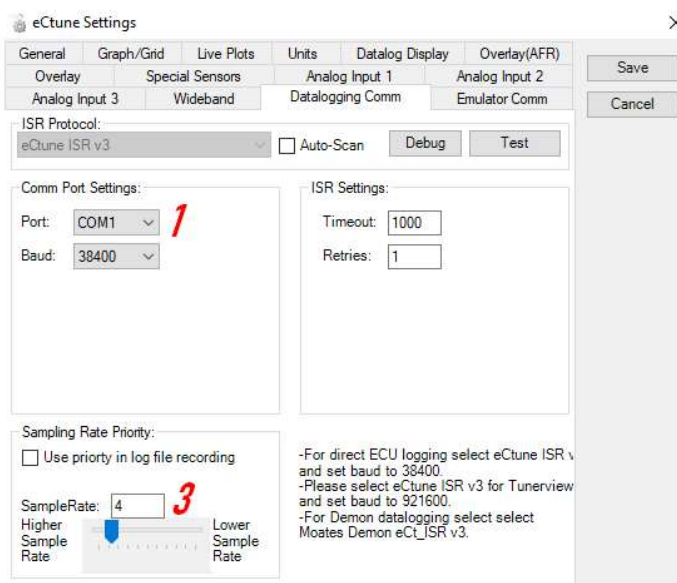
1. Go: *Settings - Emulator Comm*, and set the following settings:



## Notes:

\* - you must select the COM port number (see Connecting to a PC) for emulation (RTP)! Or set the "Auto-Scan" checkbox to automatically select the COM port number (not recommended).

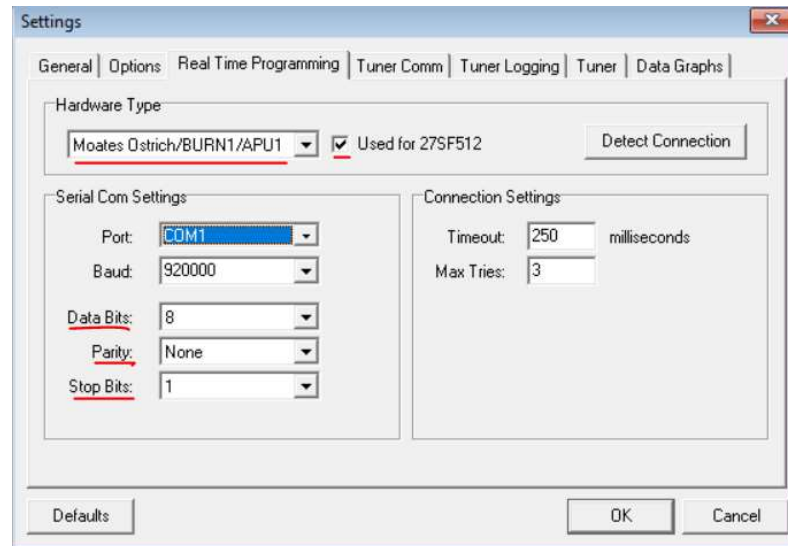
## Settings of Datalog:



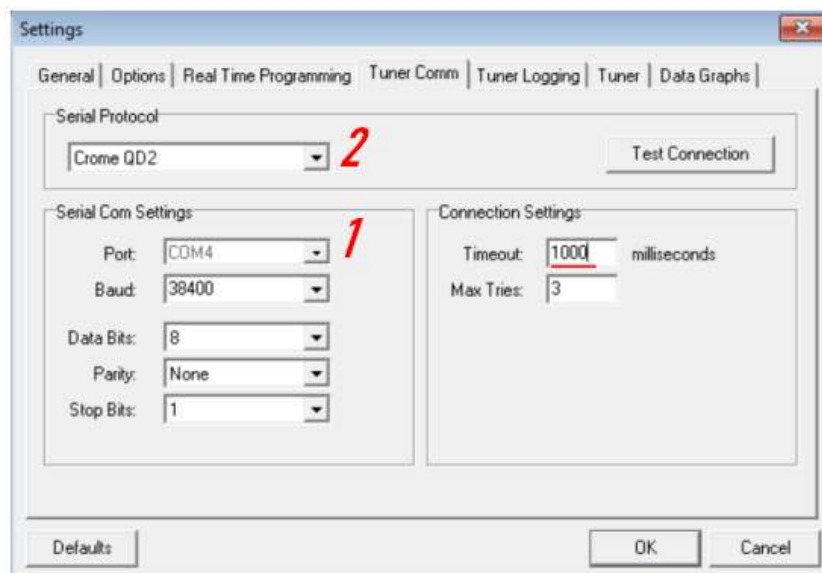
## Notes:

1. You must select the COM port number (see Connecting to a PC) for **Datalog** (**do not confuse it with the COM port number for emulation!**).
2. This value affects the speed of Datalog.

## Crome



### Settings of Datalog:



### Notes:

1. You must select the COM port number (see Connecting to a PC) for **Datalog** (**do not confuse it with the COM port number for emulation!**).
2. The protocol should choose QD2, or if you use Crome Gold - QD3, respectively.

# HTS

Settings

Emulator / Datalogging Settings Colors Wideband Other Settings Tuning/Logging Analog Inputs

Emulator Settings

Emulator: CobraRTP

Realtime Update

Record on Connection

Serial Port

Emulator Auto-Scan Port

Port: COM1

Baud: 921600

Datalog Auto-Scan Port

Port: COM2

Baud: 38400

Check Emu Serial/VendorID

Bluetooth Datalog

Serial Retries: 3

Serial Timeout(ms): 500

Datalog Sampling Rate

Priority in recording

Sample Rate: 0

Live Graphing(can be slow)

Enable Live Graphing

Retain Data for: 800 frames

# BRE

## Emulation Options

Device

Ostrich

Romulator

General

Put on Connect

Tuning Mode

Live Edit

Manual Download

Connection

Port: COM3

High-Speed

Realtime Tuning

Small Change

1 %

Large Change

5 %

Change Type:

Percentage

Add

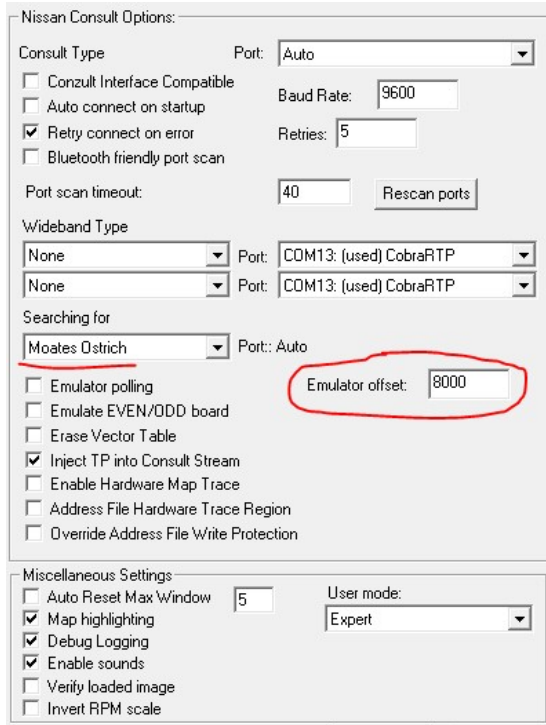
OK



---

# Nistune

To use the emulator with Nistune, you need to set the following settings:



Nissan Consult Options:

Consult Type: Auto

Consult Interface Compatible

Auto connect on startup

Retry connect on error

Bluetooth friendly port scan

Baud Rate: 9600

Retries: 5

Port scan timeout: 40 Rescan ports

Wideband Type: None

Port: COM13: (used) CobraRTP

Port: COM13: (used) CobraRTP

Searching for: Moates Dstrich

Port: Auto

Emulator polling

Emulate EVEN/DDD board

Erase Vector Table

Inject TP into Consult Stream

Enable Hardware Map Trace

Address File Hardware Trace Region

Override Address File Write Protection

Emulator offset: 8000

Miscellaneous Settings:

Auto Reset Max Window 5

Map highlighting

Debug Logging

Enable sounds

Verify loaded image

Invert RPM scale

User mode: Expert

## Notes:

1. The value of Emulator offset for firmware (bin) 32kB (most ECUs with ROM type 27s256) - 8000;  
for 16kB - 4000;  
for 64kB - 0000.

2. To emulate 16 bit (2 chips) ECUs, you need 2 CobraRTP emulators and an expansion board ([дочерняя](#)).

## More info:

[http://nistune.com/docs/NISTune\\_Emulator\\_Tutorial.pdf](http://nistune.com/docs/NISTune_Emulator_Tutorial.pdf)

[http://nistune.com/docs/NISTune\\_Type\\_2\\_Hardware\\_Install\\_Sheet.pdf](http://nistune.com/docs/NISTune_Type_2_Hardware_Install_Sheet.pdf)

---

# Dual-Mode

CobraRTP Pro allows you to download and use two different firmware (ROM, Bin). To do this, a “Dual-mod” jumper is provided on the CobraRTP Pro board, with which the firmware (memory bank) is selected:



## Upload ROMs

Upload firmware in the following order:

1. Upload ROM 1 (jumper installed - contact closed)
2. Upload ROM 2 (jumper removed - contact open)

Thus, closing and opening the contact of the “Dual-Mod” jumper, we select a memory bank and load different firmware into different areas of the emulator’s memory.

## Usage

To use, you can select the desired memory bank, i.e. firmware using the status of the jumper (closed / open), in accordance with the order of the loaded firmware.

For convenience, you can use the toggle switch, brought out at a short distance (recommended no more than 1m) using a 2-core cable.

Switching ROMs is allowed to be done with the engine running.

Also you can see video manual: <https://youtu.be/CiyAftnVTD0>

---

## !General remarks!

1. The CR2032 cell is designed to store the downloaded ROM in the device's memory, and when it is removed (after about 30 seconds), **the memory will lose data**. This can also occur with a short circuit or a complete discharge of the element (less than 2V).
2. Always be careful when installing (connecting) the device to the ECU, improper connection can lead to damage to the device.
3. Use always high-quality and as short as possible USB cable for reliable system operation.
4. Avoid installing the circuit board together with metal objects, which can lead to short circuits or voltage supply to unprotected parts of the device. Otherwise, securely isolate the device from the environment.

---

# Specifications

## Electric:

1. Supply voltage.....5 V ( $\pm 10\%$ )
2. Supply current(active).....220 mA
3. Current consumption in inactive mode (from the cell CR2032).....4  $\mu$ A
3. Memory access time .....60 ns

## Mass-dimensions:

1. Dimensions .....90x64mm
2. Weight.....67g.

## Performance Specifications and Requirements (not actual for r4.0+):

1. Ambient temperature .....-20...60°C
2. Time to full discharge (<2B) Back-up cell (CR2032), while respecting performance.....5 years.