



User manual for
Honda Edition R8-10
Doc rev. 1.11

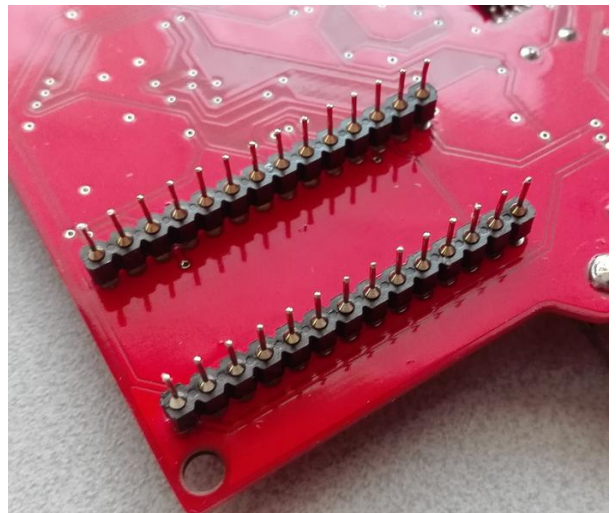
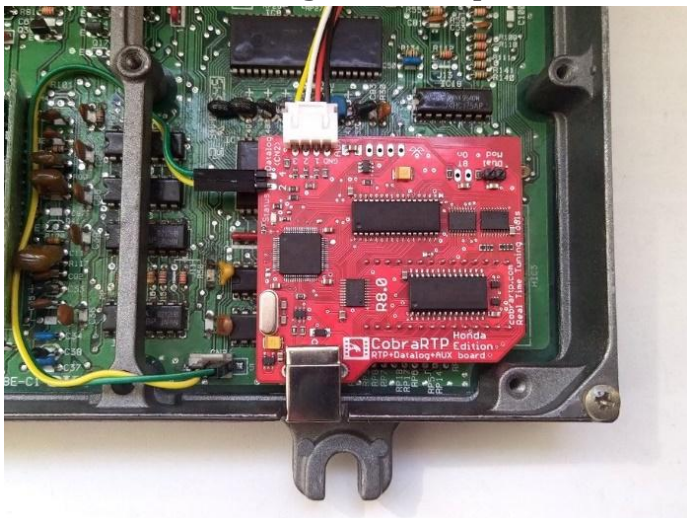


INSTALLATION IN TO ECU

First of all, your ECU must be prepared for Chip tuning, ie installed chipping kit (socket for the chip (round or V-shaped), removed J12 (or J4 for JDM) and more). **Chipping kit is not included with CobraRTP!**

How to perform chipping soldering for your ECU you can find a lot of information on the Internet, because this is a separate big topic that is not part of this manual.

Installation in the ECU is done using the pin contacts in the chip socket, as shown below, using the example of USDM OBD1.



To ensure access to the CobraRTP USB port, it is necessary to make a cutout in the ECU case.



It is worth paying special attention when installing (removing) the board in ECU, as well as during storage, since the type of pin contacts too fragile and can be easily damaged!

The **Datalog** is connected to the ECU (connector **CN2**) using a cable from the kit, as shown above.

As you can see, two data lines are used for the connection - **RX** and **TX** , respectively **2** and **4** pin of connector **CN2** in the ECU. This is true for both USDM, EDM and the JDM box type. On the CobraRTP board the correspondence to the **CN2** contacts is signed.



Do not touch the board when power is on! It can do damage under static voltage!

CONNECTION TO PC

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

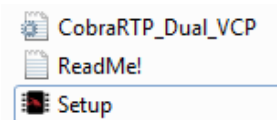
CobraRTP can only connect to a PC, ie there is no need to install (connect) the emulator to the ECU, or connect a separate power source.

Installing the USB driver

Driver installation is only required for **Windows XP, Vista, 7, 8**, for **Windows 10 and later the drivers are not required (included in OS). Just skip steps 1-2 if you have Windows 10 or later.**

1. For installing, you need to download the driver from the site on the "downloads" page: <https://cobrartp.com/en/downloads>.

2. Next, unpack the archive and install the driver using the installer (exe):

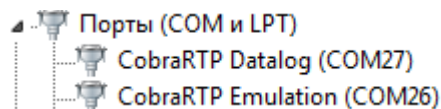


Check out the info in the Readme.txt!

```
Process started...
Driver has been successfully installed.
ExitCode: 259
Press any key for exit...
_
```

Successful driver installation

3. After installing the drivers, if there is a connected device, the device manager will display the ports and their numbers:



In windows 7 example

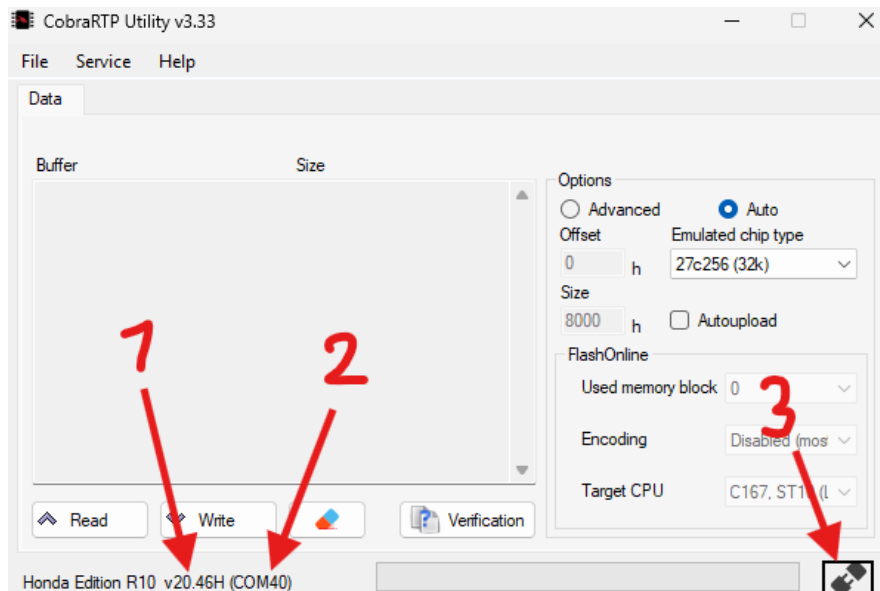
As you can see, one of the ports is for **Emulation** (RTP), the second is for **Datalog**.

Notes: The driver does not have a Microsoft digital signature, therefore, for correct operation, "Verifying the digital signature of drivers" must be [disabled](#).

Check connection

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

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



1. device firmware version
2. number of the used COM-port (for **emulation**, remember this)
3. Connection button

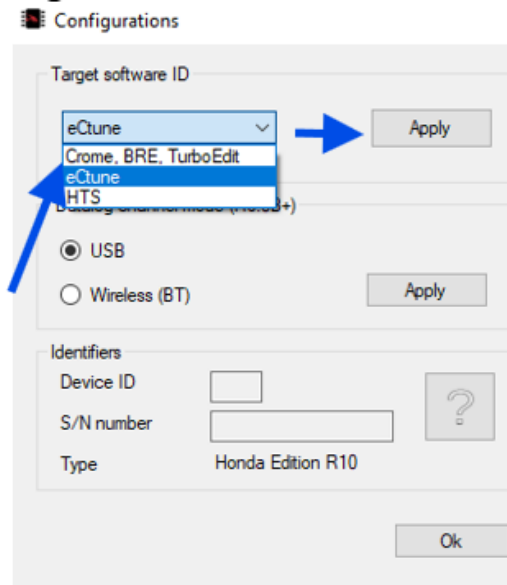
Accordingly, the second added COM-port number will be used for **Datalog**. See Device manager for more info about COM-ports.

More info about utility: <https://cobrartp.com/en/cobrartp-utility/>

BASIC TUNING SOFTWARE CONFIGURATION

Before running the emulator in eCtune, HTS, Crome and etc. you must make sure that the current TARGET SOFTWARE ID matches the program you are going to use for tuning.

To check and switch Target software ID, use CobraRTP Utility:



Follow **Service->Configurations** in program.

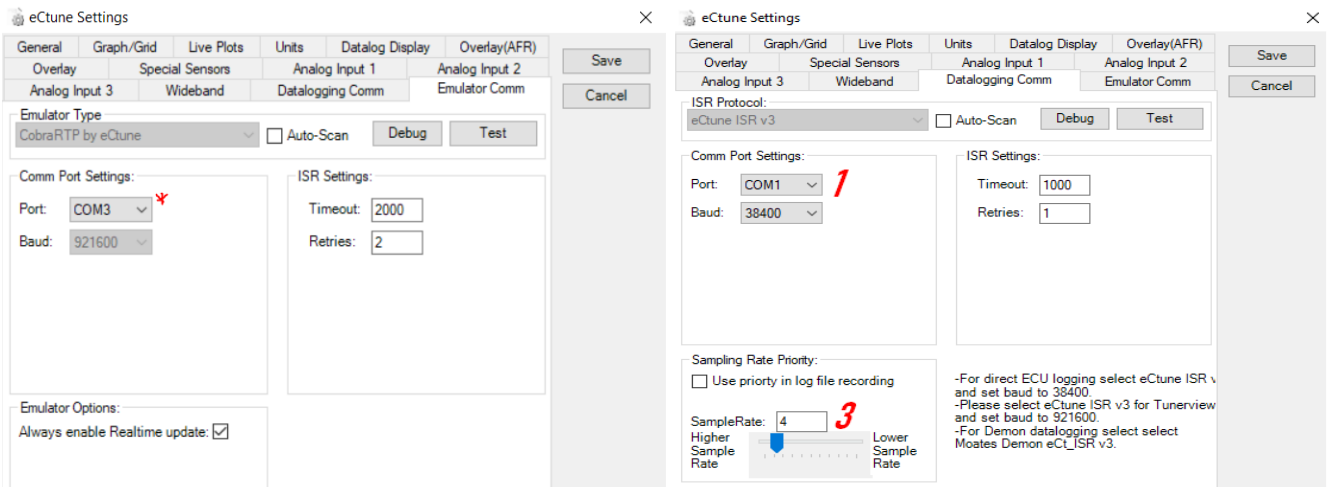
To change, you must select the appropriate software from the list and Apply.

After that, you can close utility and proceed to setting up the connection in the tuning software (see below).

Be sure to close the utility before connecting in other software! Connecting in multiple programs is not possible!

eCtune (OBD1):

You Need To Download The Prepared Version On Our Website on "**Downloads**" page.



Notes

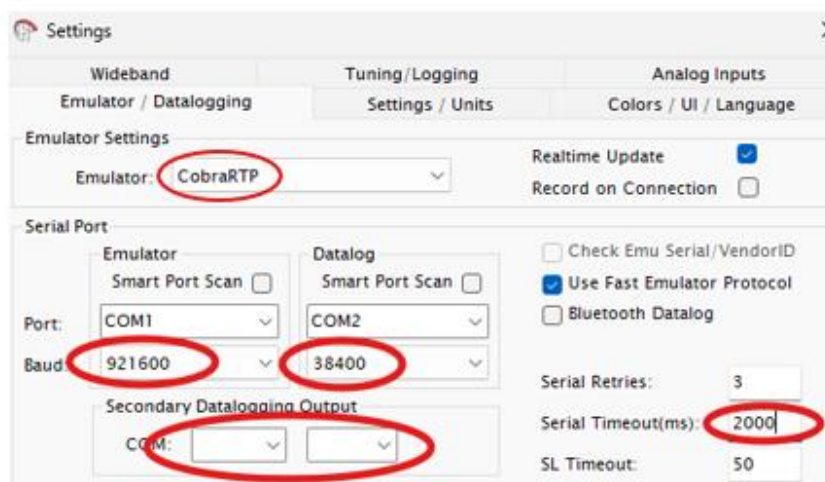
* Port for emulation (same as in CobraRTP utility)

1) Port (Datalog) - for datalog , usually one more than the emulation port number (see Device Manager (COM & LPT)).

3) Datalog speed rate for the datalog (do not neglect).

HTS (OBD0/OBD1):

<https://hondatuningsuite.com/>



Notes

- Port (Emulator) - for emulation (same as in CobraRTP utility)

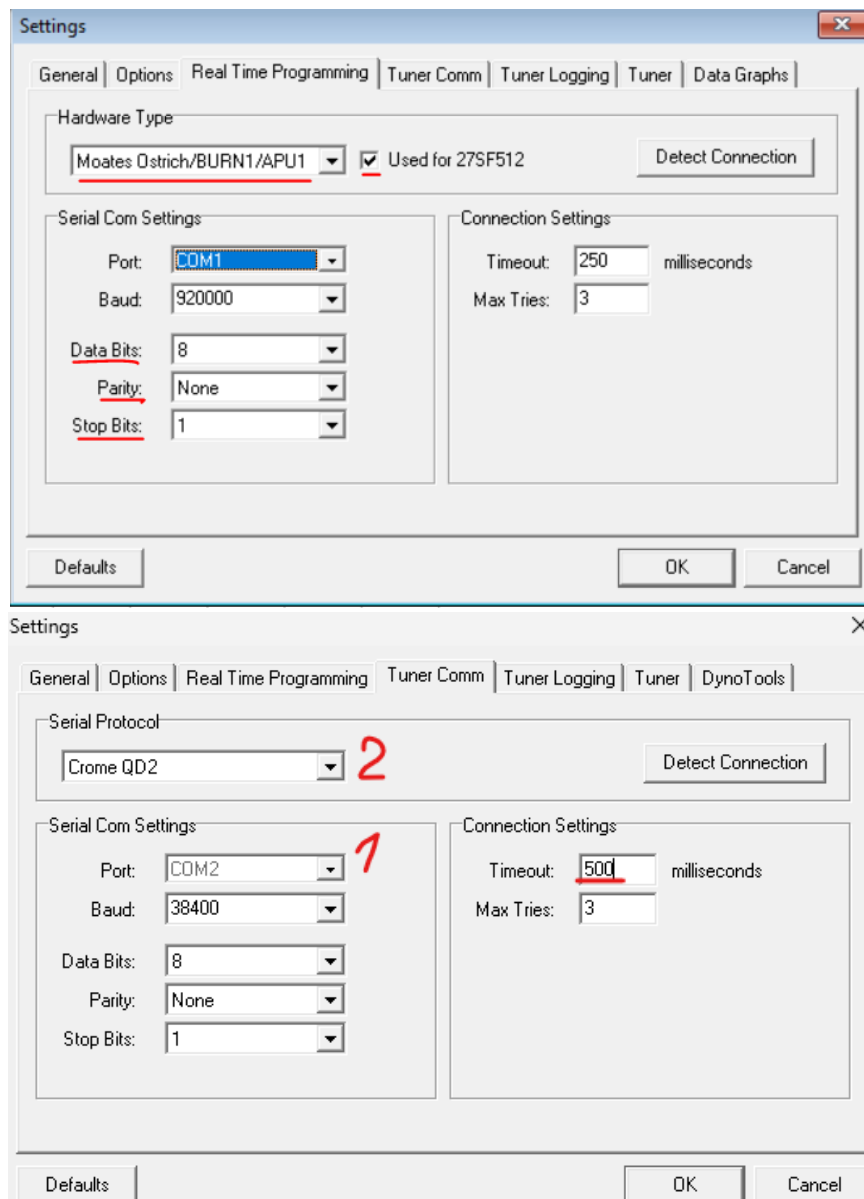
- Port (Datalog) – for datalog check it in Device Manager (COM & LPT).

- It is not recommended to use **Smart Port Scan**, it is better to select the correct COM ports manually.

Crome (OBD1):

<https://www.tunewithcrome.com/>

Recommended to use version Crome v1.5.3

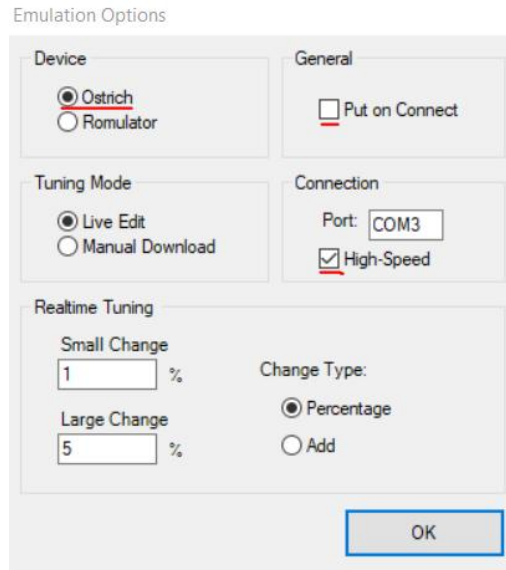


Notes

- 1) Port for datalog , usually one more than the emulation port number (see Device Manager (COM & LPT)).
- 2) The protocol should be selected QD2, or if you are using Crome Gold - QD3 respectively.

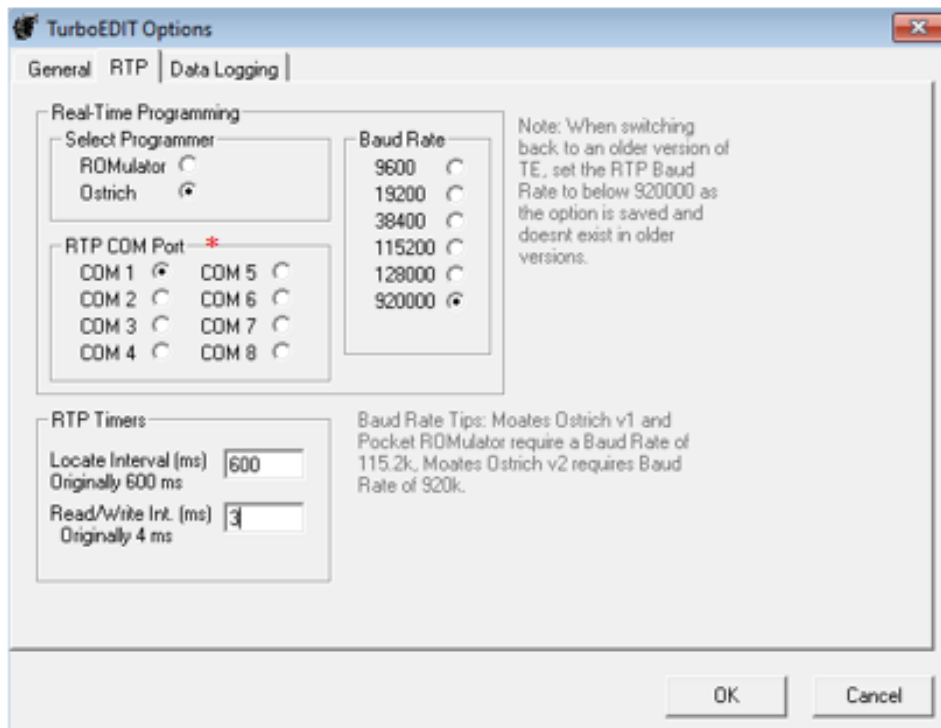
BRE (OBD0) :

<http://benogle.com/projects/bre.html>



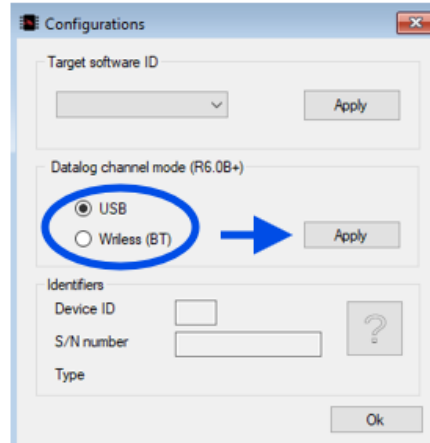
TurboEDIT (OBD0):

<https://honda-perf.net/turboedit/TurboEDIT%203.2.2%20Full%20Install.exe>



DATALOG CHANNEL MODE (USB - BT)

To select the datalog mode (channel), use the *Service-Configurations* tab in CobraRTP Utility:



To switch the mode, you must select the appropriate item and save (the selected mode is saved in permanent memory).

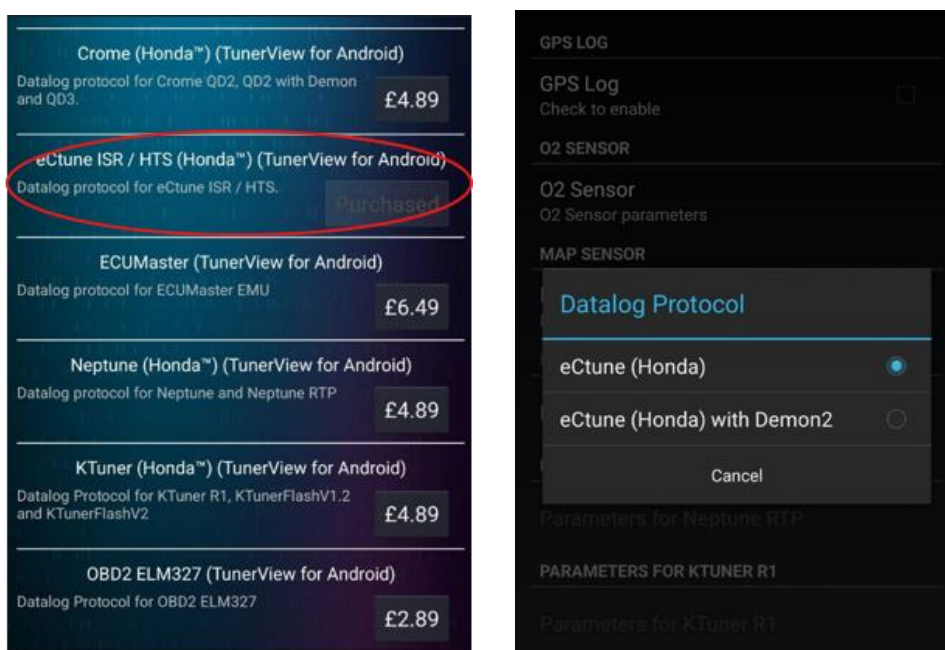
CONNECTING DATALOG VIA BLUETOOTH

To do this, you need to switch to Bluetooth (BT) mode, after which you can use datalog via Bluetooth.

Connecting datalog in the TunerView app.

To do this, download the latest version of the application and install it. For the application to work, you must purchase a license for the corresponding protocol.

Example for **HTS** and **ECtune** ISR protocol:



Before connecting in the application, you need to pair with the Bluetooth module by entering the password 1234. Make sure that CobraRTP is installed in the ECU and the ignition is on.

Tutorial : <https://youtu.be/y6EdtvHOGY>

Notes:

1. This function is designed specifically for mobile solutions! Work on PC is not guaranteed!
2. The Bluetooth module built into CobraRTP is supported only by Android OS.

CONNECTING DEVICES TO AUX IN/OUT INCLUDED IN THE R10 VERSION AND THEIR SETTINGS

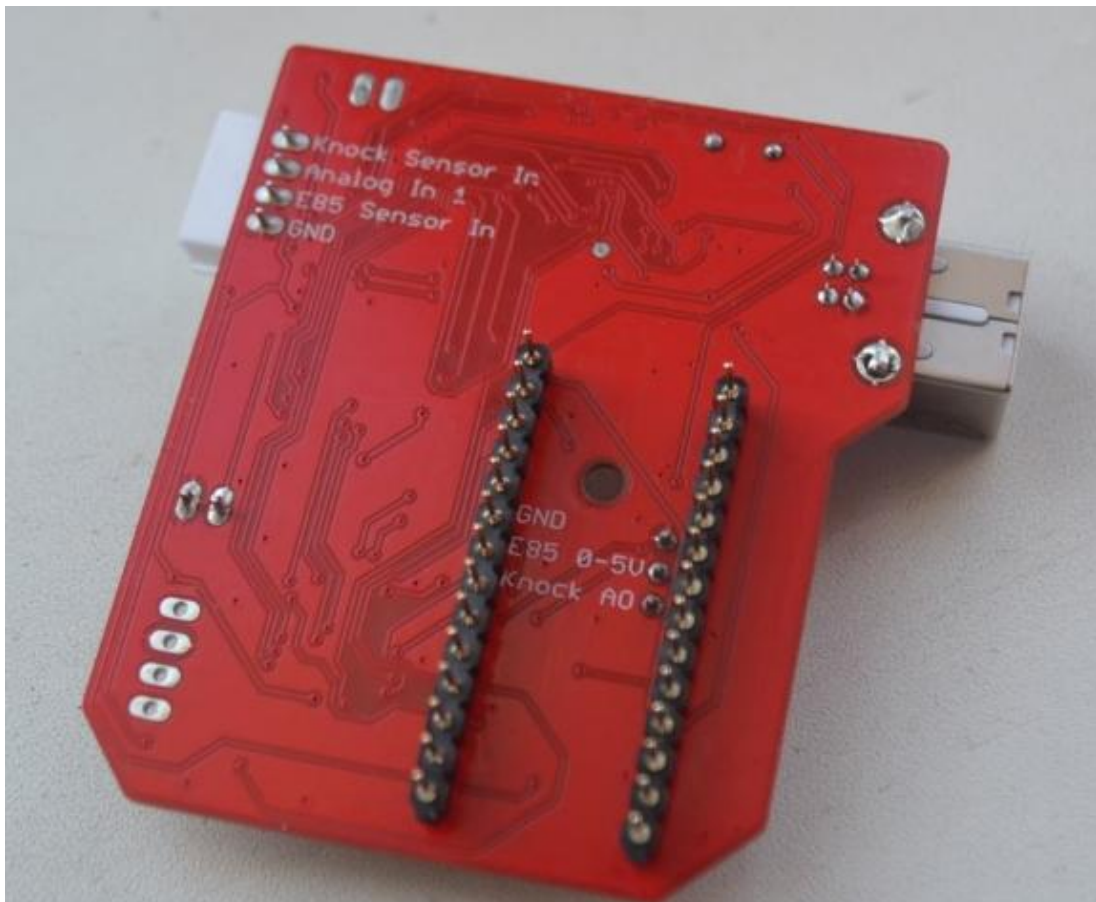
DESCRIPTION OF NEW FEATURES

New functions make it possible to use ethanol content sensors to implement the FlexFuel system with an OBD1 ECU, as well as the ability to connect a knock sensor (hereinafter referred to as **KS**) to monitor engine knock.

The FlexFuel interface on R10 board is a converter of a discrete signal from an ethanol content sensor into an analog 0-5V signal that is “understandable” for the ECU using an analog output as part of the AUX Out. There is also the ability to display readings in tuning software.

The knock sensor interface allows you to connect broadband sensors to monitor the knock sensor signal in tuning software, as well as output the signal to external devices via AUX Out using 0-5V analog output.

AUX IN/OUT DESCRIPTION



AUX in – intended for connecting sensors (signal input):

1. *Knock Sensor In* – knock sensor signal input.
2. *Analog In 1* – general purpose analog input (0-5V), works the same as in previous versions. Input resistance 16kOhm.
3. *E 85 Sensor In* – ethanol content sensor input (E85).
4. *GND* – common (ground) relative to all AUX In inputs.

AUX out – auxiliary outputs:

1. *Knock AO* (knock audio output) – audio output of the KS signal. Designed for connecting headphones or for recording audio in devices with a microphone input.
2. *0-5V Out (E85 0-5V)* – configurable analog output with a range of 0-5V. Can be configured as an ethanol content output or as a knock signal level output. Designed for connection to ECU inputs or other indicating devices with 0-5V input.
3. *GND* – common (ground) relative to all AUX Out outputs.

SELECTION AND CONNECTION OF SENSORS

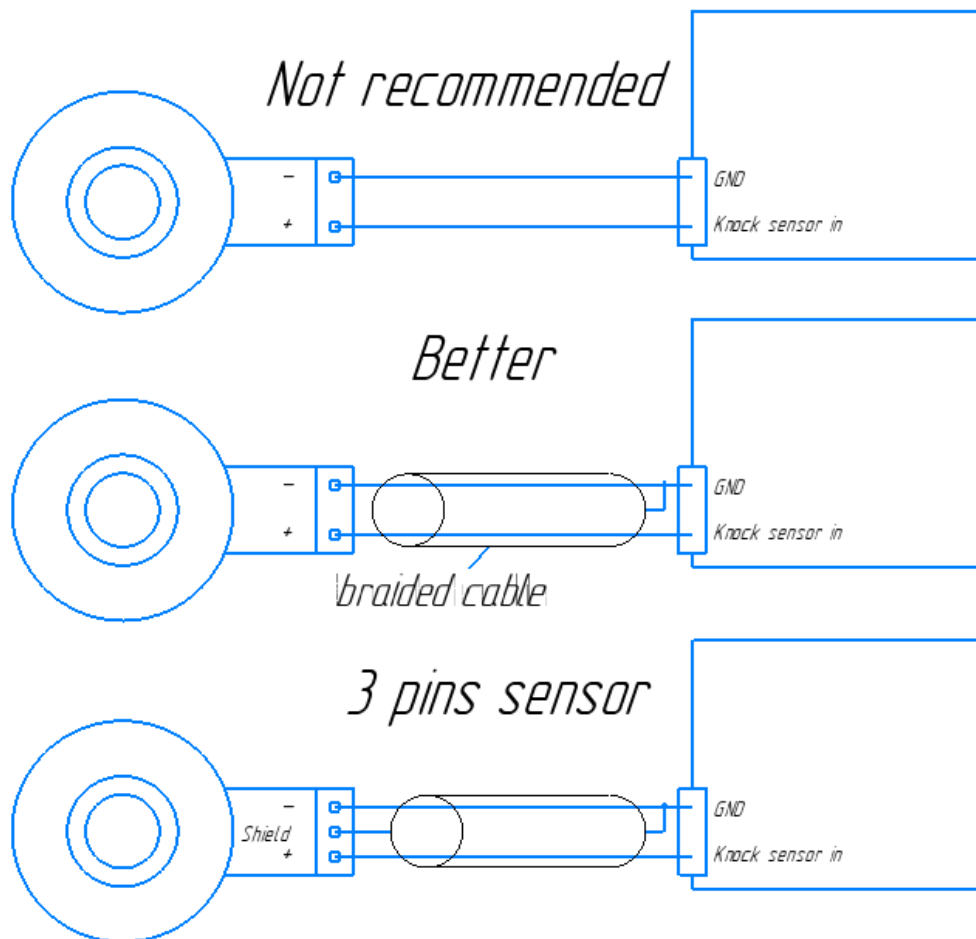
Knock sensor.

As a knock sensor, it is necessary to use a broadband piezoelectric sensor with two or three contacts (the third is usually used for shielding), in most cases it looks like this:



Connection

It is recommended to use a shielded cable for connection to reduce electromagnetic interference:



Installation

The knock sensor should be installed on the cylinder block, ideally in the standard place of the factory KS sensor.

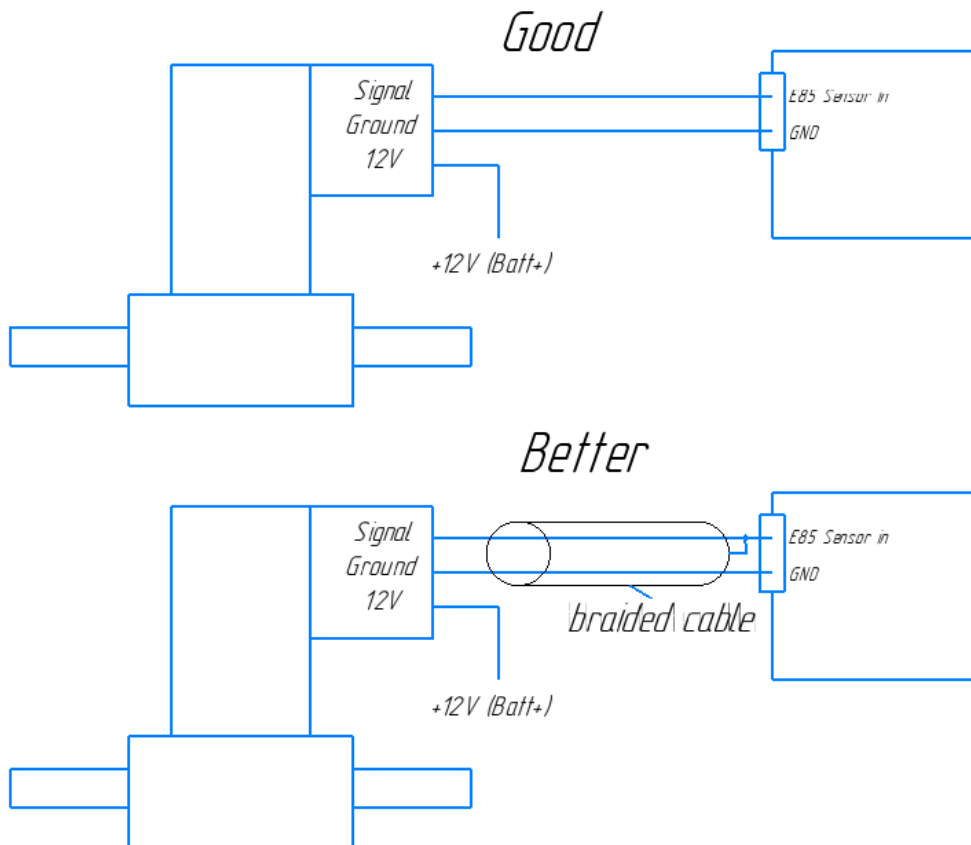
Ethanol content sensor.

Version R10 is designed to work with an ethanol content sensor with an output signal of 50-150Hz. These include GM sensors: 13507128, 13577429, 13577394.



13577429

Connection

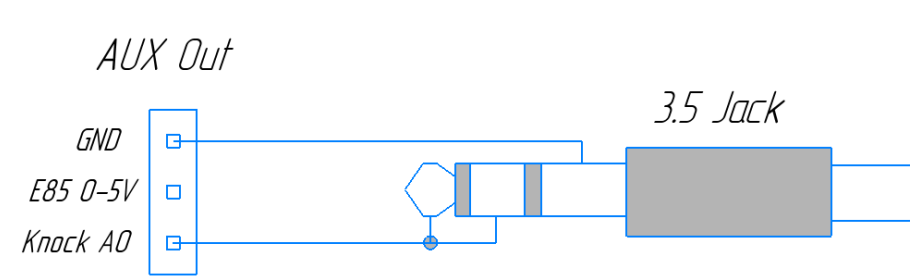


CONNECTING DEVICES TO AUX OUT

Headphones.

Use any headphones with a speaker coil impedance of at least 35 ohms and with volume control (optional, but recommended).

Connection



This output can also be connected to a recording device, such as a PC, to record the sound of the knock sensor signal through the microphone input.

0-5V Output.

Currently, this output is intended to output parameters such as the processed knock sensor signal or the level of the ethanol content signal in the fuel.

Output mode [1]	Output voltage level	Expected parameter/value
KS linear 0-5V	0 V	Low level
	2.5 V	Mid-level
	5 V [3]	High level
Detonation (0V/5V) [2]	0 V	No detonation detected
	5 V	Detonation detected
E85 0-5V	0 V	0%
	2.5V	50%
	5V [3]	100%

- 1) According to the configurations in CobraRTP Utility, see next.
- 2) If you have a knock detection indicator configured, this mode simply repeats it to the analog output.
- 3) Value may be slightly lower than 5.00V due to imperfections in the output characteristics and supply voltage.

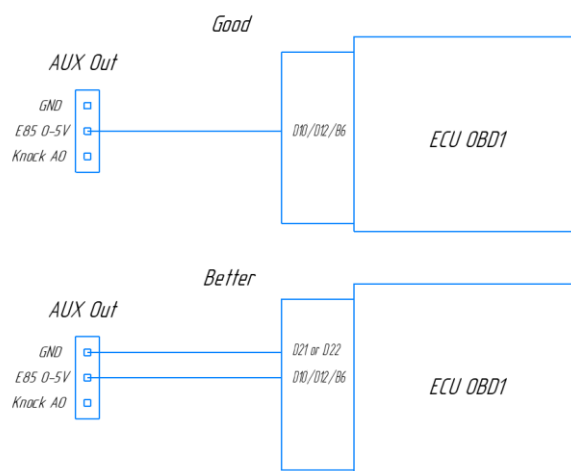
Connection to ECU

To expand the capabilities of the ECU and enable additional functionality in Honda Tuning Suite, this output must be connected to one of the analog inputs of the OBD1 ECU:

D10 (ELD) (need to remove R136 and R138 on USDM)

D12 (EGR) (recommended)

B6 (need to remove R2 and R3 on USDM).

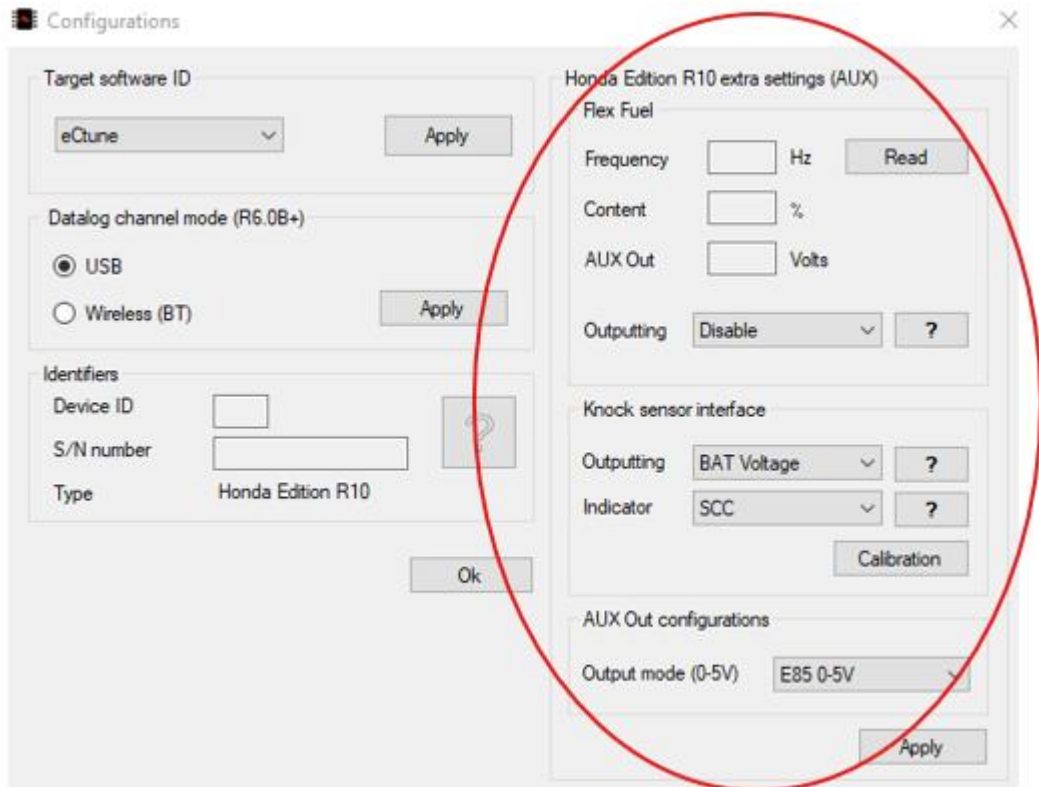


Notes

1. Be careful when connecting! An incorrect connection may damage the emulator's analog output!
2. AUX Out work correctly only if there is power from the ECU.

AUX IN/OUT CONFIGURATIONS

Configuring AUX ports, as well as other options related to the KS and FlexFuel interface, is done in CobraRTP Utility (Service -> Configurations):



Flex Fuel – group of settings for the ethanol content sensor interface. Here you can check the current ethanol content readings and configure the *outputting* of the readings to the datalog channel data stream using the ISR protocol to indicate the ethanol content in HTS , eCtune , etc.

Knock sensor interface – group of settings for the knock sensor interface. Here you can configure the output of readings to the datalog channel data stream using the ISR protocol to indicate the processed KS signal in HTS, eCtune , etc.

Indicator – select an indicator when the detonation detection threshold is reached in the tuning software for the selected channel using the ISR protocol .

Calibration – calibration of the knock sensor (see details below).

AUX Out configuration – 0-5V output settings (E85 0-5V). Here you can set the operating mode of this output.

Note

Always use the latest version of CobraRTP Utility, and also keep an eye out for device firmware updates!

KNOCK SENSOR CALIBRATION AND KNOCK DETECTION RECOMMENDATIONS

Calibration is necessary to more accurately determine the knock detection threshold in the processed KS signal, and is performed for a specific sensor, engine and sensor installation location. It is also recommended to perform calibration when changing the engine configuration, for example, even after installing a different camshaft, because the overall engine noise may change. **However, the knock sensor interface included in the new version does not provide a 100% guarantee of detonation detection, since it is not professional equipment for this purpose and is designed as an additional feature of this class of device.**

To perform calibration, the sensor must be installed and connected according to the recommendations described above. The emulator must be installed in the ECU and function correctly.

To be ready for calibration, you need to connect to the emulator in CobraRTP Utility and go to *Service -> Configurations -> Calibration*:

Knock sensor calibration

Knock sensor calibration is carried out individually for each sensor, location of the sensor installation on the cylinder block and engine, and is aimed at minimizing influence of natural engine noise on readings.

Calibration conditions:

1. During the test, the knock sensor must be installed on the cylinder block and connected to the CobraRTP board via AUX In.
2. The engine must be running.
3. During calibration you must work through the operating range engine speed (1000-6500 rpm).

Detect

Current val RPM

Coefficients

	500-1000	1000-2000	2000-3000	3000-4000	4000-5000	5000-6000	6000-7000
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

The engine must be running before calibration can begin. During the calibration time (about 15 seconds), you must “work through” the entire engine speed range to determine the calibration coefficients for all RPM ranges. Change engine speed smoothly, avoiding sudden accelerations, to more accurately determine the coefficients. After calibration, the calibration parameters are saved in the device memory.

The coefficients in the normal case should be in the range of 10-120, and the maximum value of all should be at high RPM and from about 50 to 120.

Detect - Indicates that a knock sensor signal (noise) has been detected.

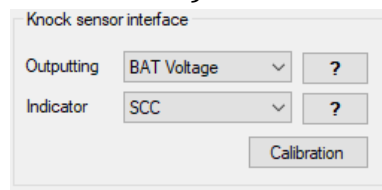
Current val – current noise level (0-255).

To better understand detonation detection, we recommend using headphones. In combination with indication in the software, this will allow you to create an accurate picture of the presence of detonation in the KS signal.

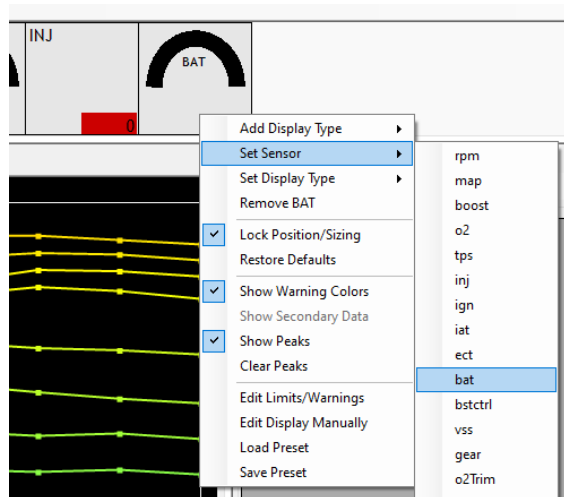
The sound of detonation knocking is significantly different from other “rustling” engine noise, which is monotonous and only changes depending on the RPM. The detonation sound is similar to “clicking”, you can easily distinguish it from the natural noise of the engine.

EXAMPLE OF SETTING UP MONITORING IN TUNING SOFTWARE

Let's look at setting up the display of the knock sensor signal in HTS . For example, let's select signal output via the *BAT Voltage* (battery voltage) channel, and select *SCC* (service check connector) as the detonation detection indicator:



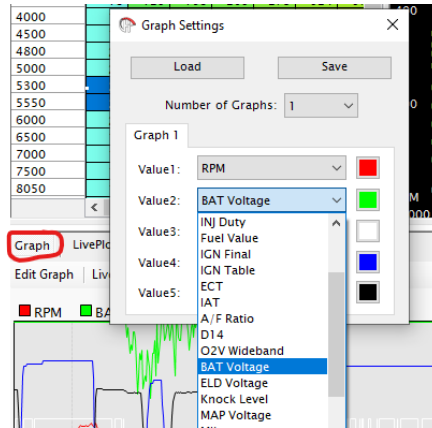
Setting up virtual gauge in HTS:



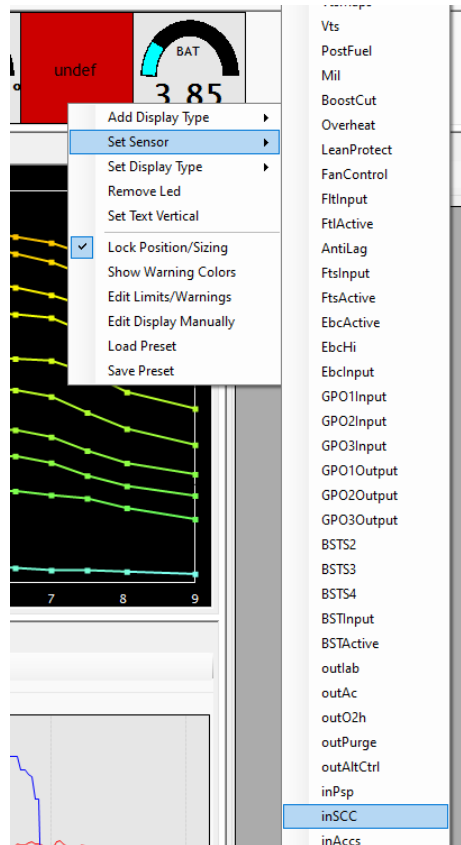
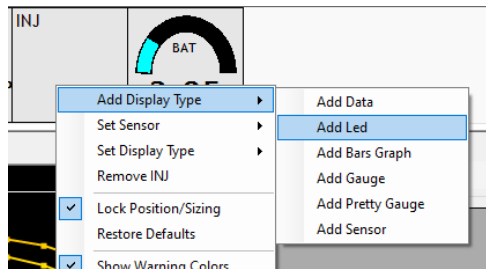
Since this parameter is intended to display the voltage of the on-board network, the ratios will be as follows:

0% - 0 V
50% - 12 V
100% - 24 V

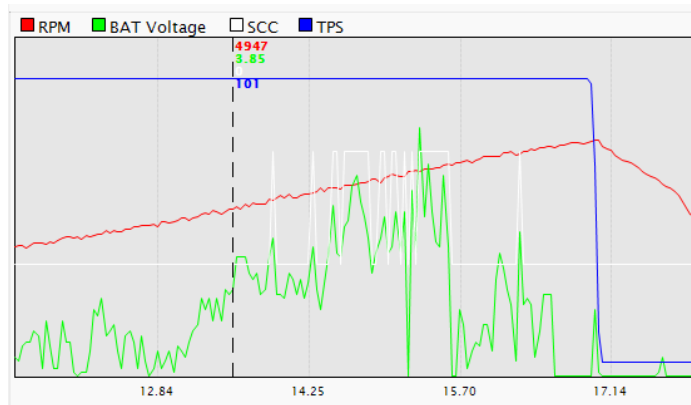
For ease of display, the knock sensor signal can be added to Graph to present the signal as a live graph:



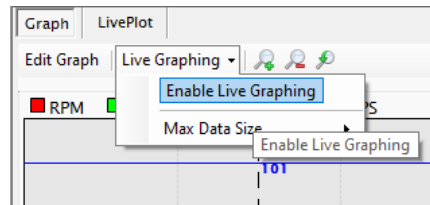
We will also configure the indication of the detonation detection signal:



On Graph you can also add a signal from this indicator and analyze both signals on one chart:



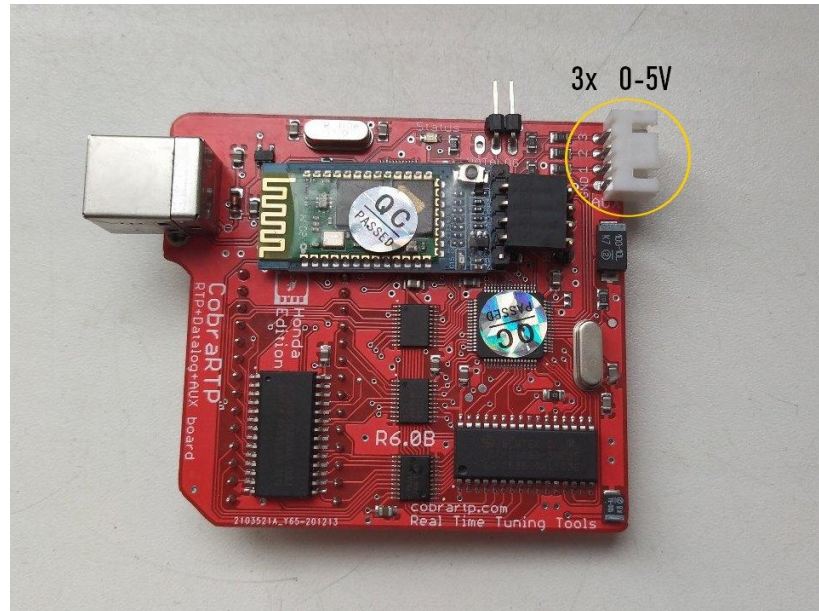
Don't forget to turn on Live Graphing for real-time monitoring when datalog is enabled :



Similarly, you can customize the monitoring for FlexFuel .

CONFIGURING AUX INPUT IN VERSIONS R8-R9

The analog inputs in the versions up to R9 are used as an option (AUX) to expand the capabilities of the limited analog inputs in the ECU.



Settings for HTS:

Settings

Emulator / Datalogging Settings / Units Colors / UI Wideband Tuning/Logging Analog Inputs

ECU Demon CobraRTP

Enable CobraRTP Inputs
70 Polling timeout

Note:
CobraRTP onboard analog will be read every 70ms.

Analog Input 1	
Voltage	Value
0.00	0.00
5.00	6.34

Units:
Decimals:

Analog Input 2	
Voltage	Value
0.00	0.00
5.00	6.34

Units:
Decimals:

Analog Input 3	
Voltage	Value
0.00	0.00
5.00	6.34

Units:
Decimals:

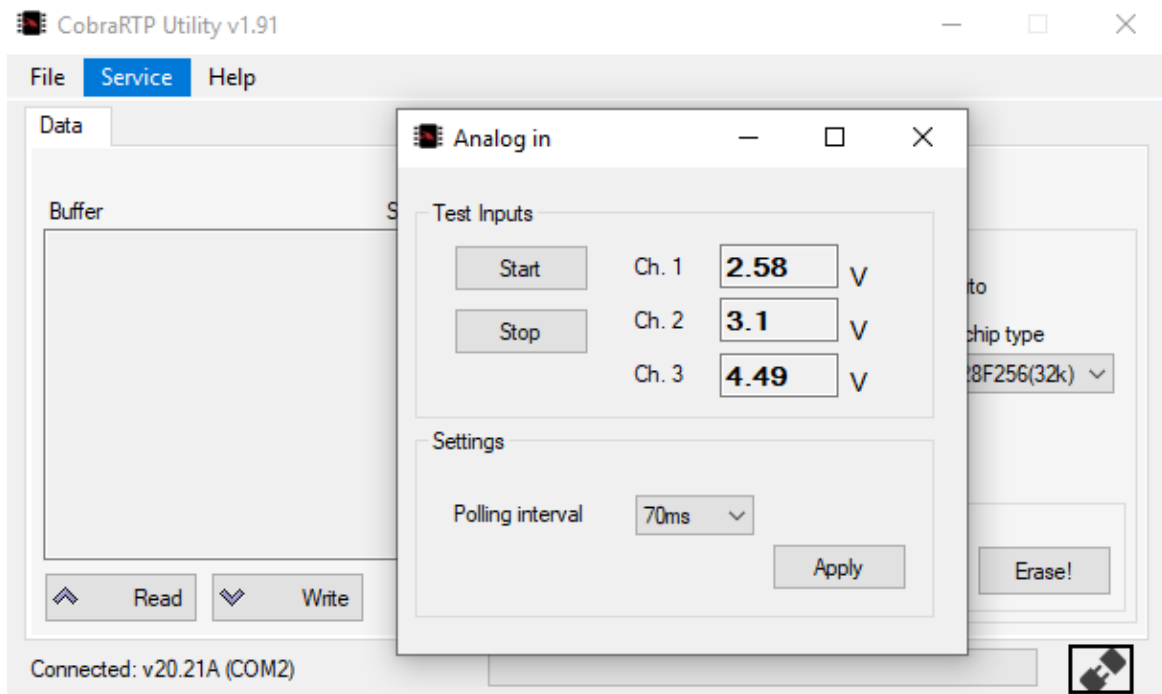
This function is included with datalog:

Data	Value
GPO 1 Input	<input type="checkbox"/>
GPO 1 Output	<input type="checkbox"/>
GPO 2 Input	<input type="checkbox"/>
GPO 2 Output	<input type="checkbox"/>
GPO 3 Input	<input type="checkbox"/>
GPO 3 Output	<input type="checkbox"/>

Cobra AUX	

EmuAux1	
EmuAux2	
EmuAux3	
EmuAux4	
EmuAux5	

Also analog inputs (AUX) can be checked and configured in the CobraRTP utility *Service - Analog in* :



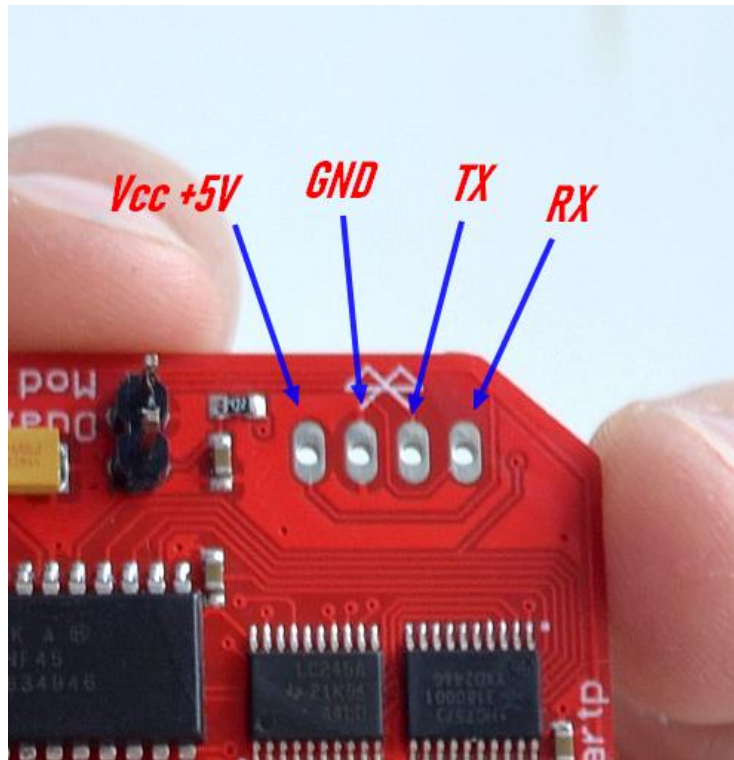
The voltage will correspond to that specified for one or more channels (1-2-3) between GND.

INSTALLING BLUETOOTH (BT) MODULE

To do this, you need any BT module with next requirements:

- Communication speed (baud rate): **38400 bps**
- Power supply voltage: **5 V**

The connection diagram is shown below:

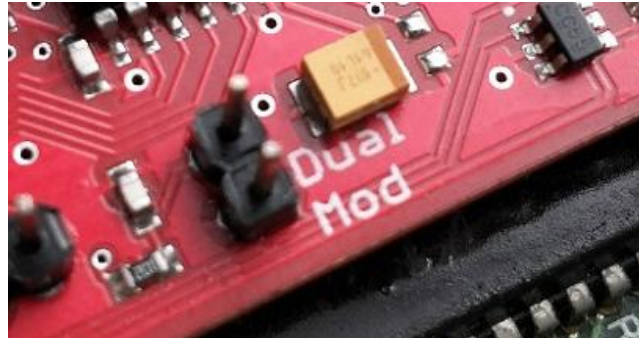


Note:

1. In most cases, it is **necessary to configure the Bluetooth module**, since they are usually initially set to 9600 bps.
2. Chinese HC-05/06 is directly compatible by pinout.

DUAL-MAP FEATURE

CobraRTP Honda Edition starting with revision R7 allows the upload and use of two different basemap's (Bin). For this, a "Dual- mod" jumper is provided on the board, with the help of which the firmware is selected (memory block):



Upload two ROMs (basemap)

Firmware download is performed in the following order:

1. Upload ROM1 (jumper installed - contact closed)
2. Upload ROM2 (jumper removed - contact open)

Thus, by closing and opening the contact of the "Dual-Mod" jumper, we select a memory block and upload different firmware into different areas of the emulator's memory.

Using

For use, you can select the desired memory area, ie ROMx using the jumper state (closed / open), in accordance with the order of the uploaded.

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

It is allowed to switch firmwares with the engine running.

Also, you can see the video instruction: <https://youtu.be/CiyAftnVTD0>

STATUS INDICATOR

On the CobraRTP board of all variants, LED indicators of the current state of the device are provided:



Status – emulator status indicator has 2 modes:

1. Battery _ life :

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

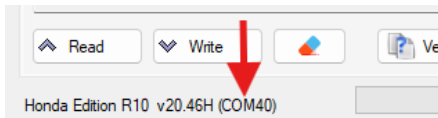
2. Tuning :

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

TROUBLESHOOTING

1. Connection issues in tuning software

- Check if the Target software ID is selected correctly in CobraRTP Utility
- Check if the COM port number is selected correctly. You can find out the correct COM number in CobraRTP Utility:



- Maybe the port is busy by another program. For example, you cannot connect in the CobraRTP utility and HTS at the same time.

2. Datalog issues

- Check if the datalog wires are connected correctly
- Check if the COM port for the datalog is correctly selected (**differs from the emulation COM port number**)
- Check software settings for datalog according to the manual
- If you have a version with **bluetooth** - make sure that the used datalog channel is selected in the configurations (CobraRTP Utility, see above)
- Check if J12 (J4 for JDM box) in the ECU is removed
- Make sure the device is loaded with the ECU firmware (baserom + calibrations) from the program you're using. For example, you can't connect the datalog if you're using HTS but the device has ECU firmware loaded from Crome.

If the issue with datalog persists, check CobraRTP hardware in the **CobraRTP Utility** by following the *Service* -> *Test (self-diagnostic)* -> **Datalog channel** and follow program instructions.

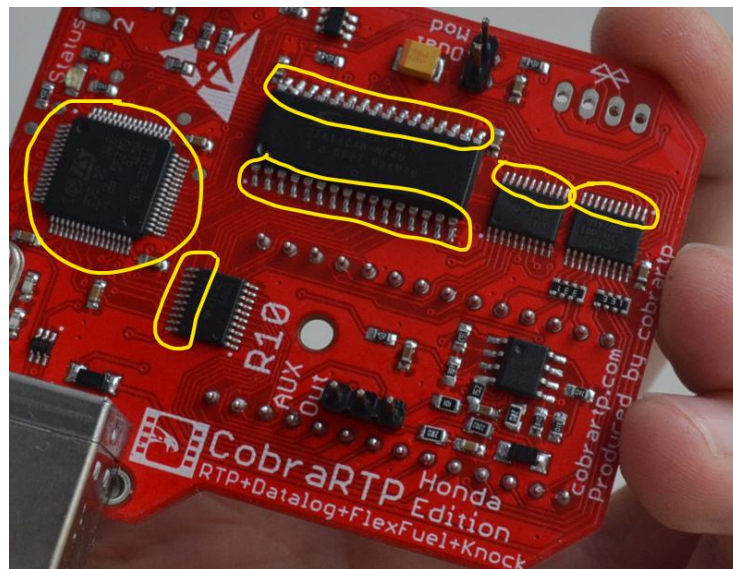
Also, one of the rare causes that have been discovered by our customers is a pin-to-pin short:



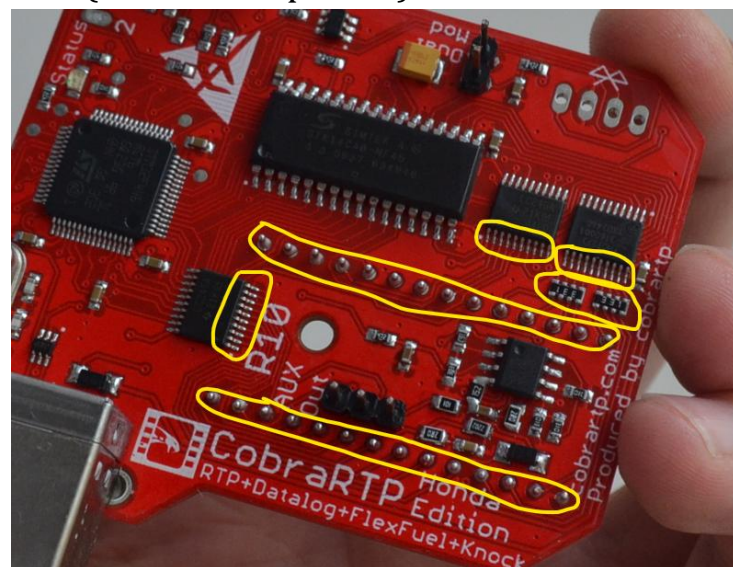
3. Car won't start or working in the Limp mode (Check engine is always on)

- Check if unused sensors are disabled in options (HTS, eCtune, BmTune)
- Check 28 pin socket contacts in ECU
- Make sure that if J1 is installed and have good contact in the ECU
- You can check hardware in CobraRTP Utility: follow **Service – Test (self-diagnostic) – ROM** and follow instructions in program.

If the test result is negative, then check the board, it may be a pin-to-pin short circuit. In this case, you should check all the pins of:



If result is positive (ROM test is passed) then check it's:



If you still have issues, please contact us: <https://cobrartp.com/en/feedback/>

SPECIFICATIONS

1. Supply voltage5 V ($\pm 10\%$)
2. Supply current..... 50-70 mA
3. Memory access time60 ns
4. Memory access time when memory write process.....250 ns
5. Analog input resistance.....16 kOhm
6. Ambient temperature -20...50°C