MBkeyprog-2

USER MANUAL

We present to your view a hardware system MB Keyprog 2.

Its **main function** is to facilitate the programming of Mercedes "optical keys". Besides the program works independently with ECUs dumps, gear box etc.

Attention! These instructions don't claim to be completely up-to-date. The program is in constant updating and the newest changes might not be included in these instructions. In addition to these instructions we advise to use **Help** directory in the corresponding windows.

After you have connected the main unit from your set to USB port, you will need to install the drivers (included). The process of drivers installation is not described in this manual.

Run the program.

1. Operating bookmark W203_W220:908
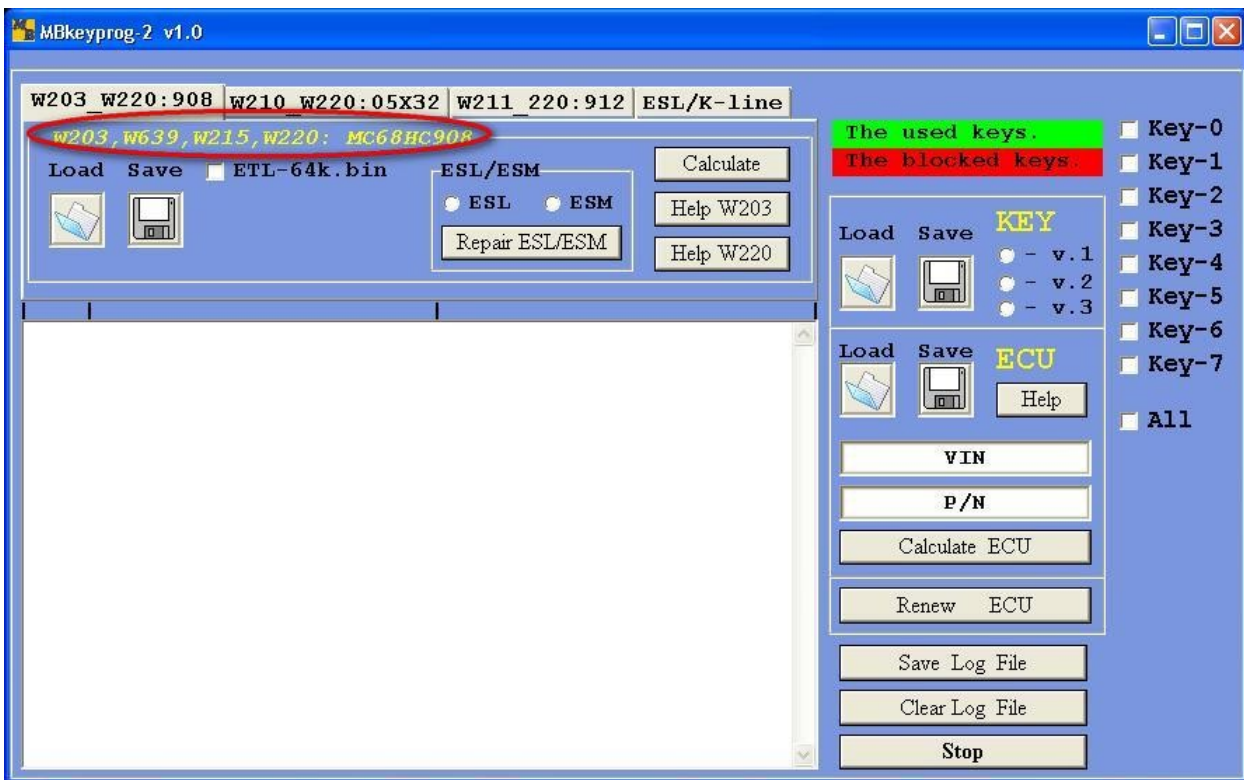
The program initially opens at **W203_W220:908 bookmark.** It means we work with the EIS, where processor **MC68HC908AS60(AZ60)** is installed. You can see the list of the cars where the EIS is based on this processor in the program window (encircled in red).

Below there is a view of the EIS processor.

Further there is a view of the EIS processor **W215** and **W220**.

The processor dump which we marked as **CPU KEYS** should be considered a suitable programmer. At first you should unsolder the processor and read it with the programmer if it is necessary (depends on the programmer you use). If you use programmer **ETL**, then you have to tick the window in front of **ETL-64k.bin** inscription.

Press **LOAD** directory in the top left window and upload the previously read dump processor.
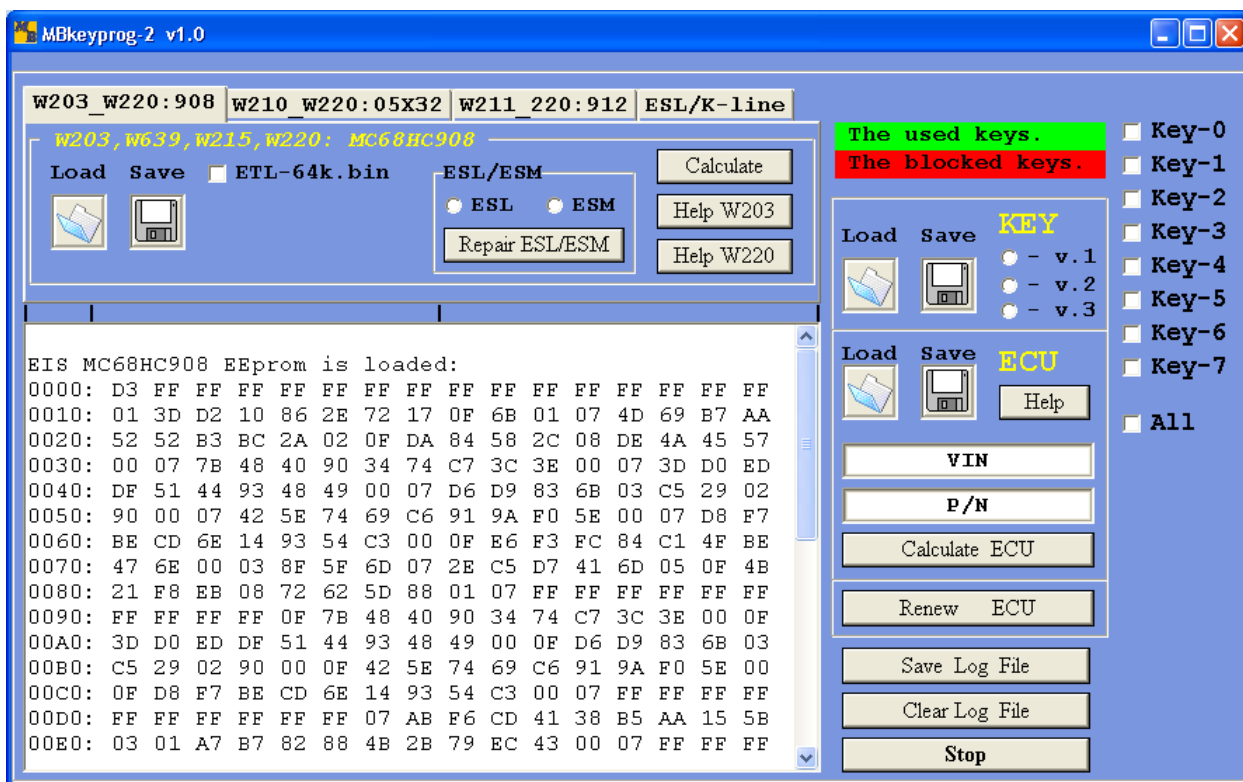

In the top right part of the window you see **The used keys** and **The blocked keys** bookmarks.

Unfortunately we can't get the information about the number of used keys in this vehicle from the EIS dump based on processor 908. But if this car has locked keys we see them enriched in red.

Now according to which Mercedes you work with (W203 or W220) you must choose – put a dot in **ESL/ESM** window - and tick the positions where you fill in the keys. For example, you work with Mercedes W220 (you choose **ESM**) and you wish to fill in three new keys positions from 0 to 2.
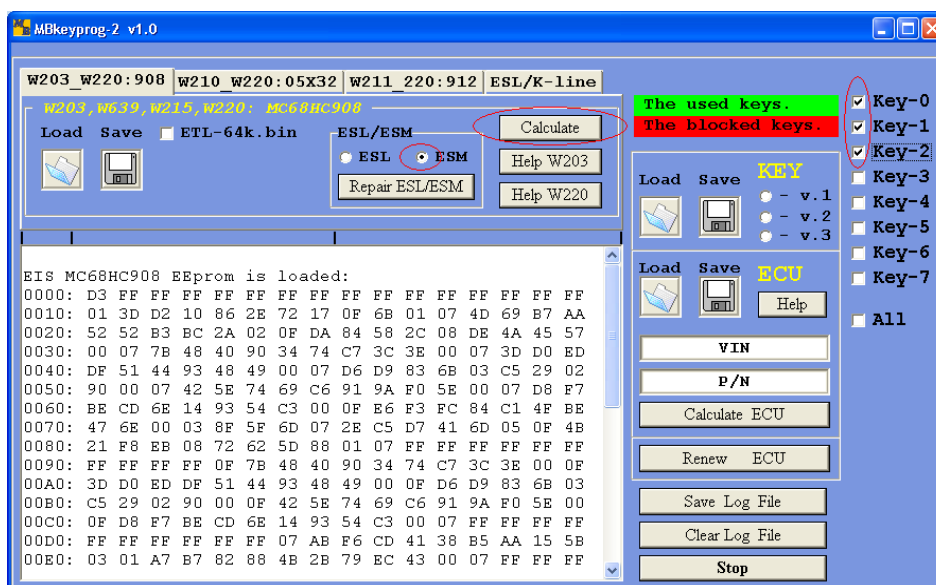
Now press **Calculate** after that you will see
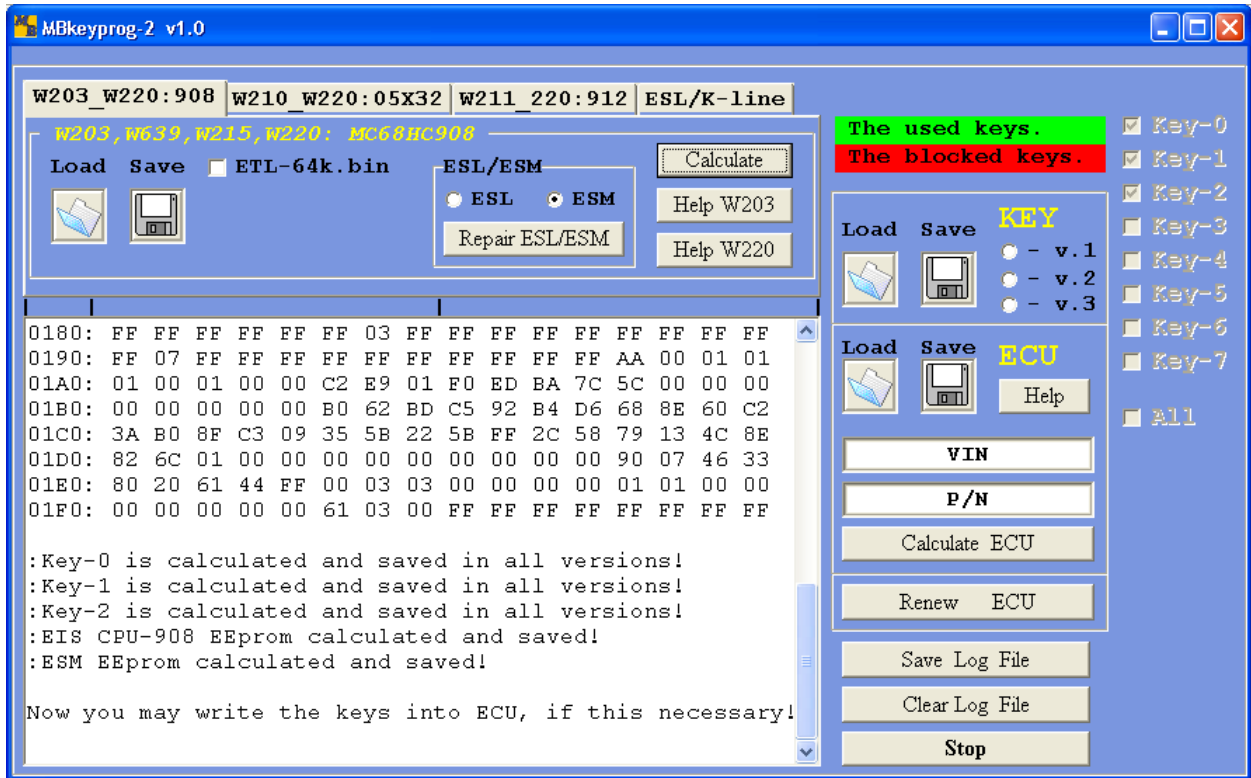
The following dumps will be automatically (!) saved to the same directory where the previously read EIS processor dump has been uploaded from. The new EIS processor dump **EIS_CPU-908_New.bin**, the new ESM (Electronic Selector Module) **ESM_New.bin** and the new three keys dumps in three different versions (!) (you can read about the different versions of the key dumps at the end of this manual) **Key-0_v1.bin, Key-0_v2.bin,Key0_v3.bin, Key-1_v3.bin, Key-2_v2.bin, Key-2_v3.bin.**

Now you may generate a new ECU dump, where our new keys will be "located". To do so load the previously read ECU dump in the ECU window.
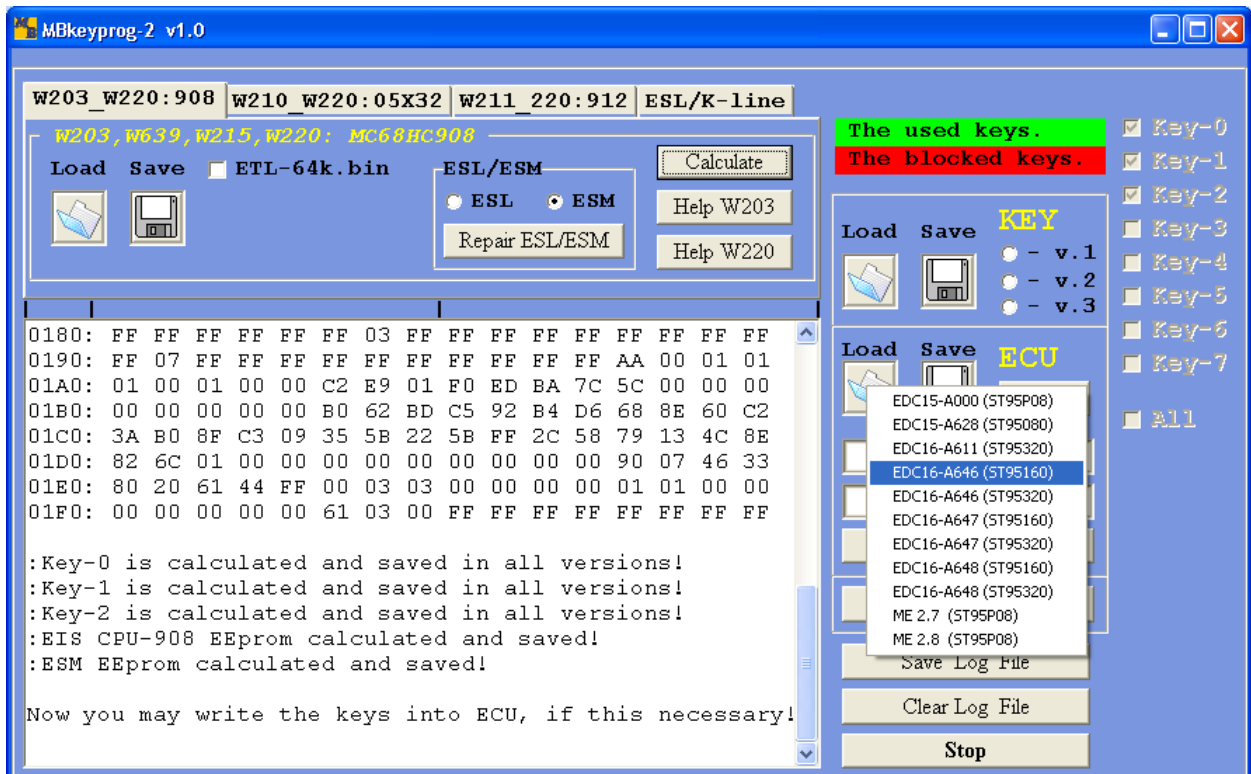
If the loading is successful you will see
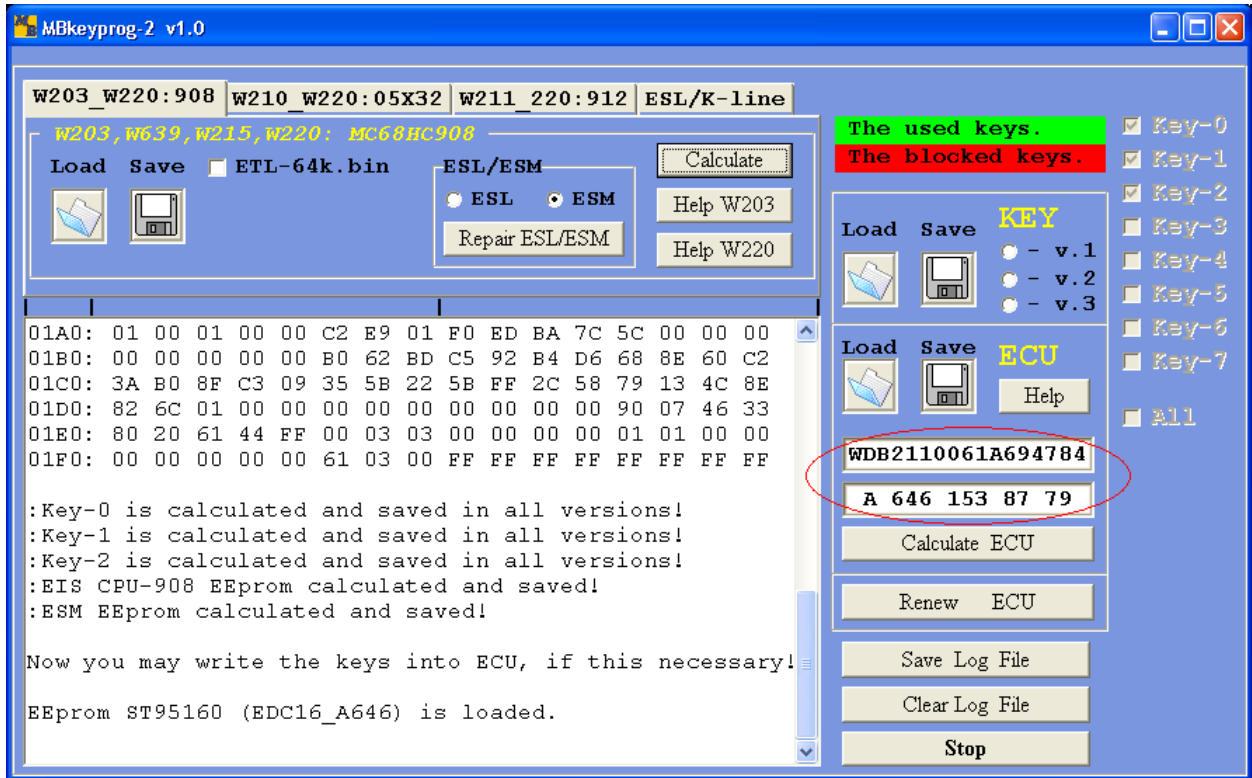
In the circled windows you see VIN-code and ECU factory number. If a correct dump has been chosen while loading you will see, at the least, the right VIN-code. If the VIN-code field is empty you have chosen the wrong version while downloading the file. Press **Calculate ECU** and you see
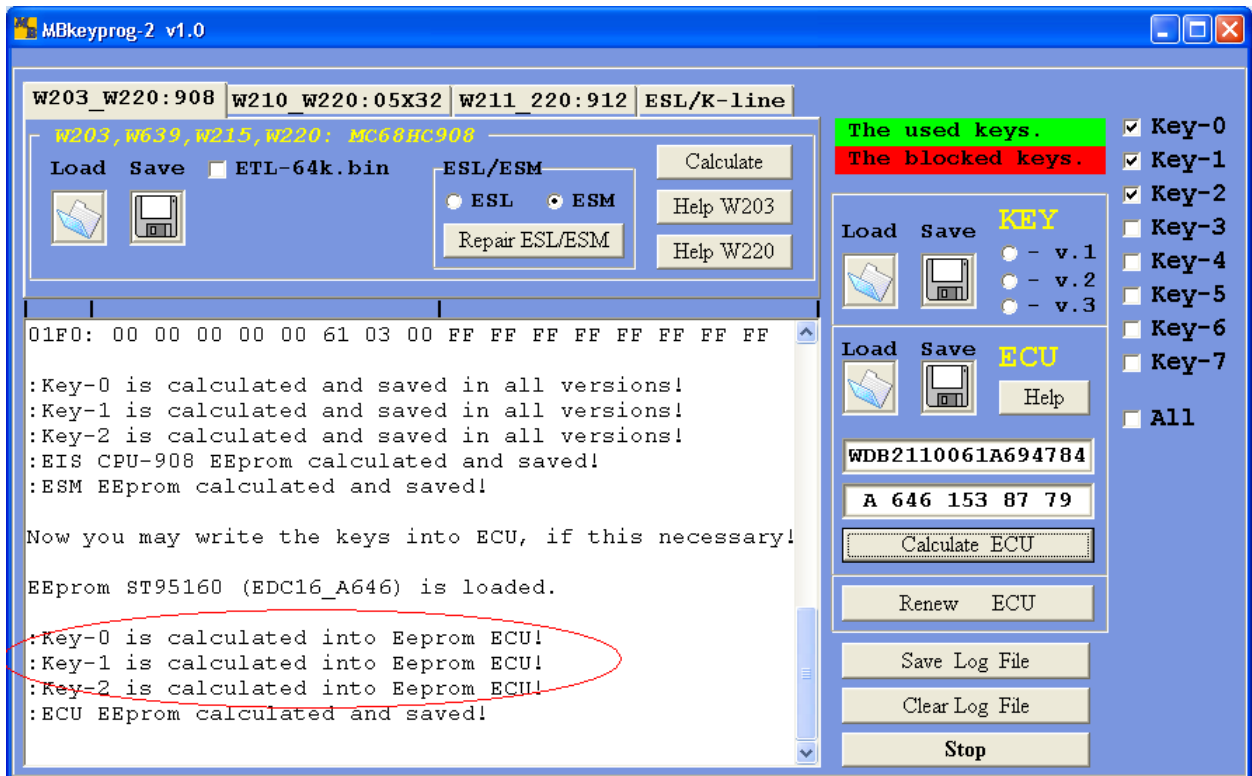
The new ECU dump is automatically saved in the initial directory with _**New** added to its name.

Now you see all the dumps for programming the EIS, the three keys, ECU and ESM (Electronic Selection Module)

In the following picture you can see the location of EEPROM **93c56** microchip on the ESM plate.

Write the dump to the EIS processor, which has been generated and automatically saved before. Write the necessary dump versions to the key processors. Write the dump with the written keys to the ECU.

You may need to insert the key in the EIS several times (up to 32), till the key is "accepted". Normally you succeed the first time.
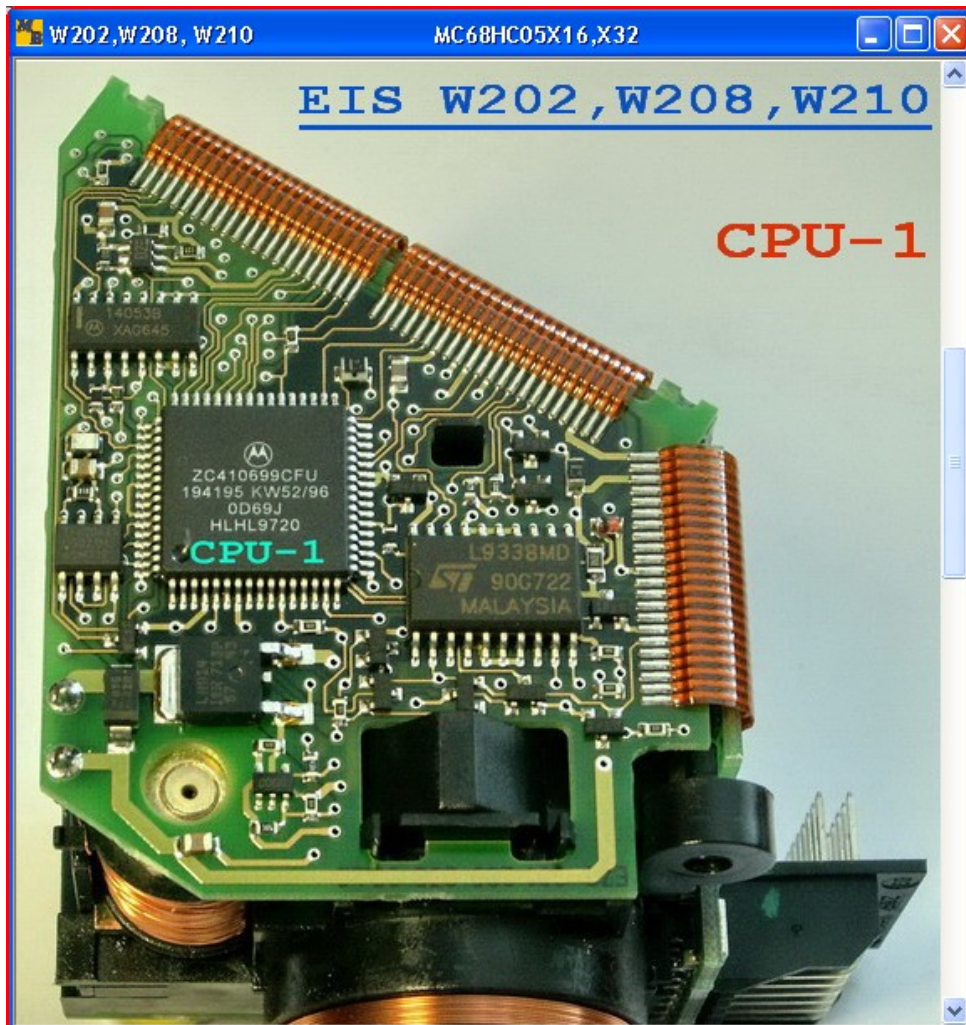
Return the vehicle to the client!

2. Operation with bookmark W210_W220:05x32.
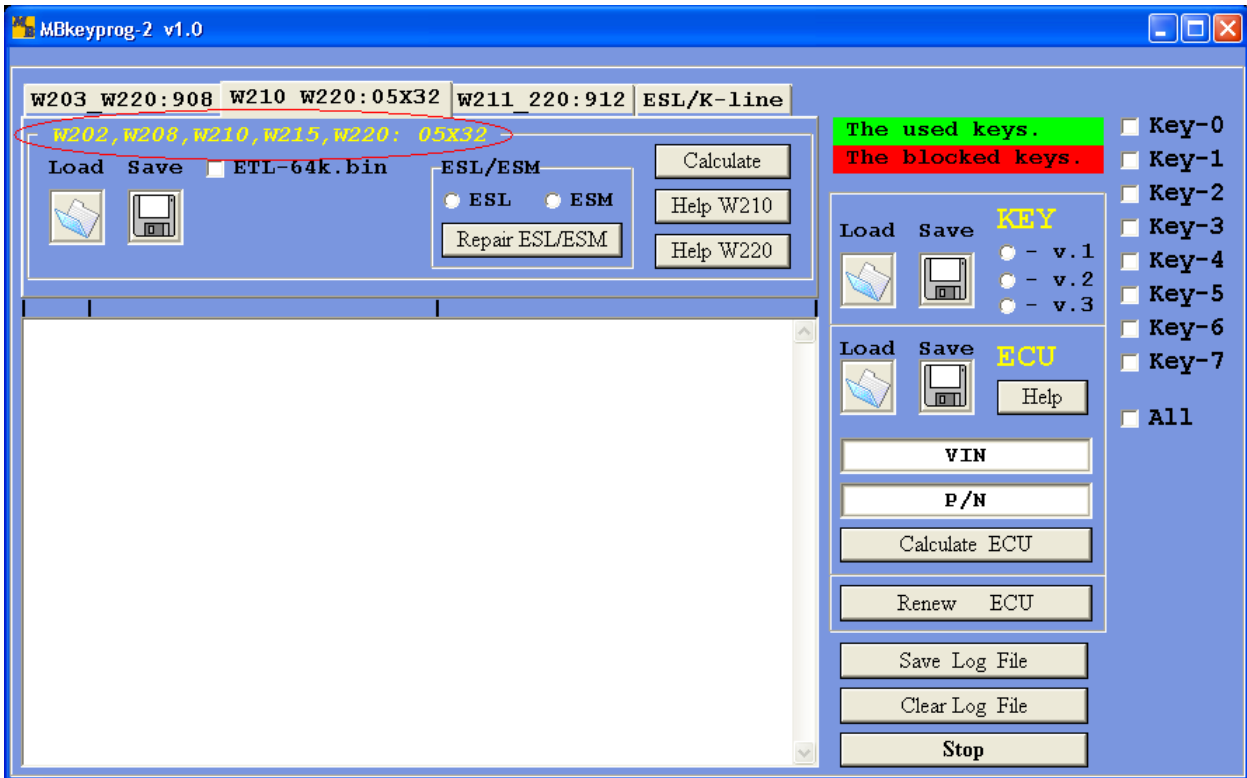
The list of cars marked in red have **MC68HC05X32** processor in their EIS.

Below you can see **CPU1** processor location in the EIS of Mercedes W210.

Further you can see **CPU2** processor location in the EIS of Mercedes W210.


Below you can see the location of **CPU1** and **CPU2** processors in the EIS of Mercedes W220

As an example we will study the process of writing three new keys been to Mercedes W210. We should read the contents of **CPU1** and **CPU2** processors from the EIS. Remember these processors are protected against reading and attempts to read them with the help of a programmer which can't evade this protection will lead to the initial dump damage! If you use **ETL** programmer, it is necessary to put a tick in the window with the inscription **ETL-64k.bin** in front of it.
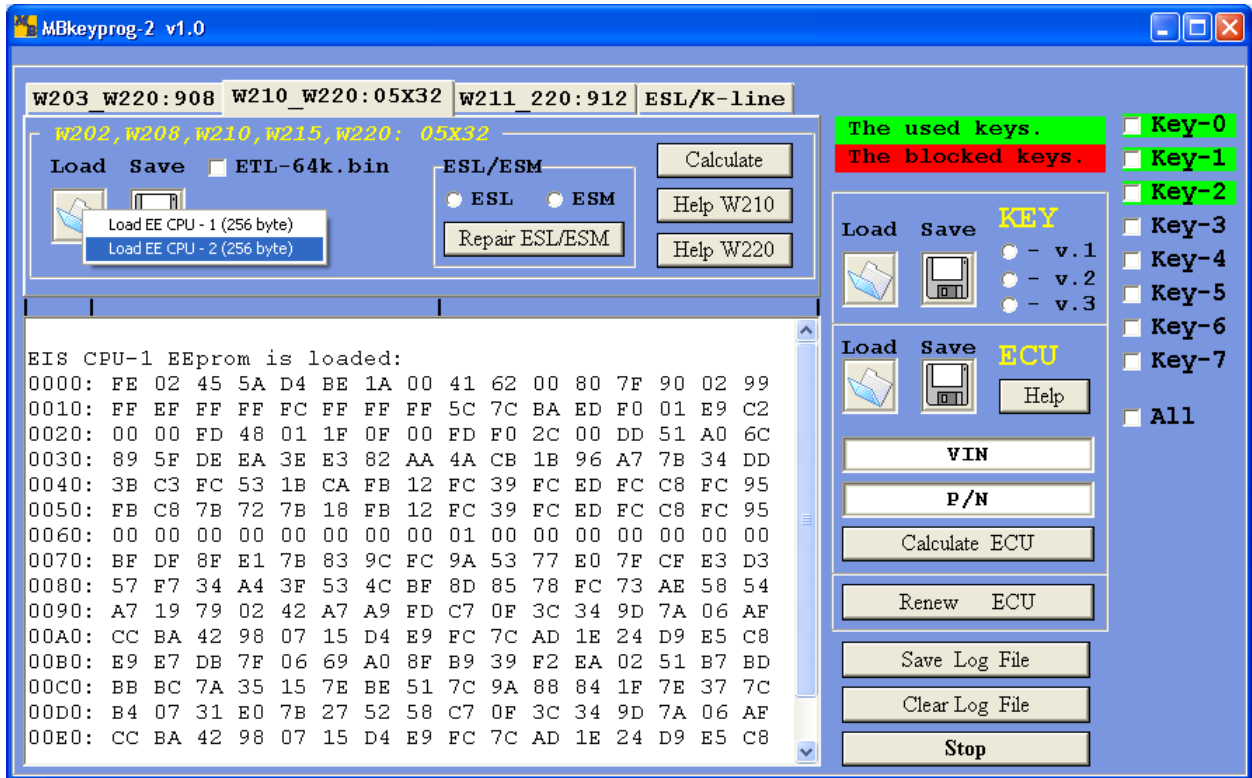
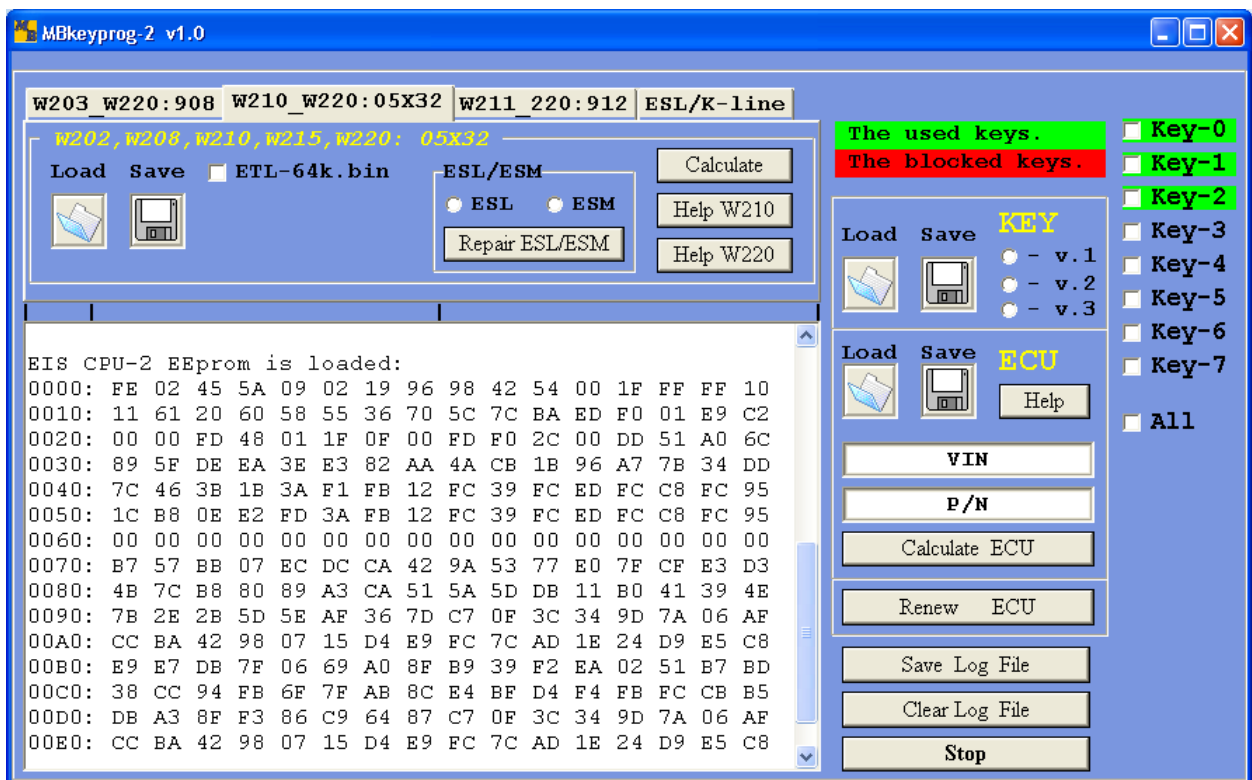Load the previously read dump to the program.
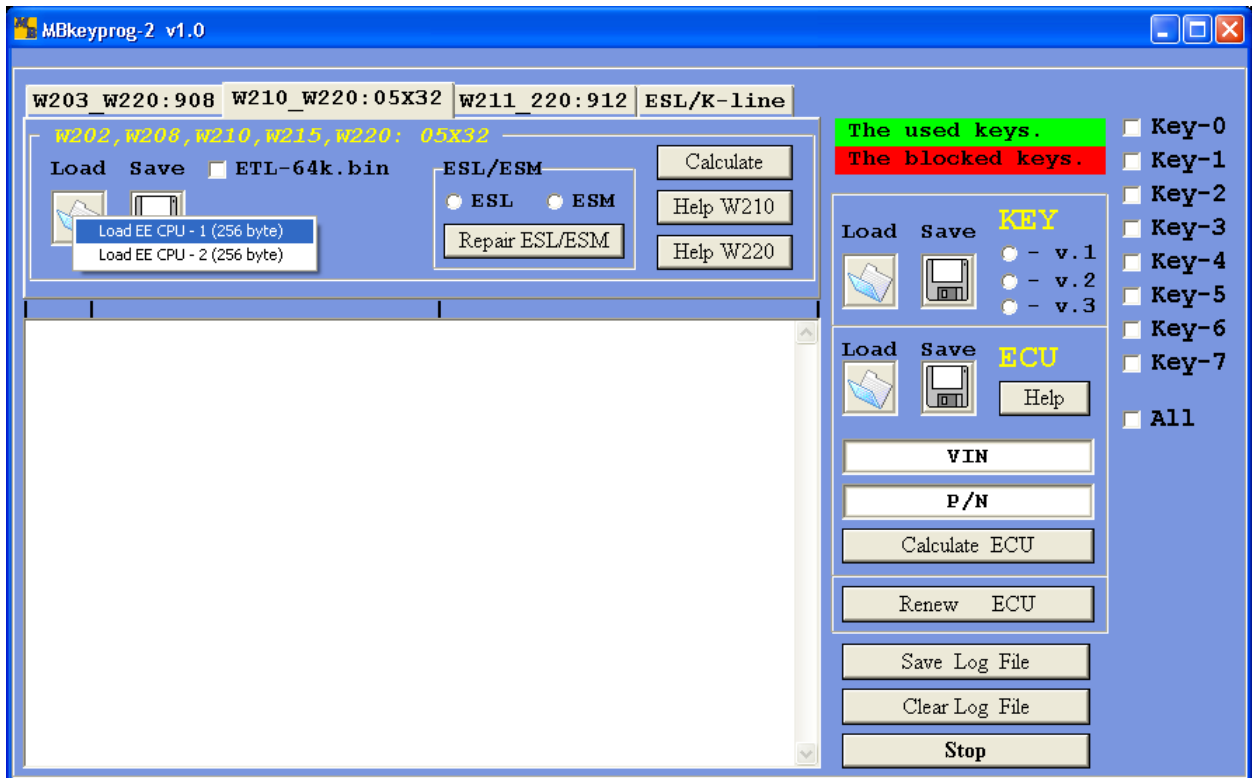
After loading you can see
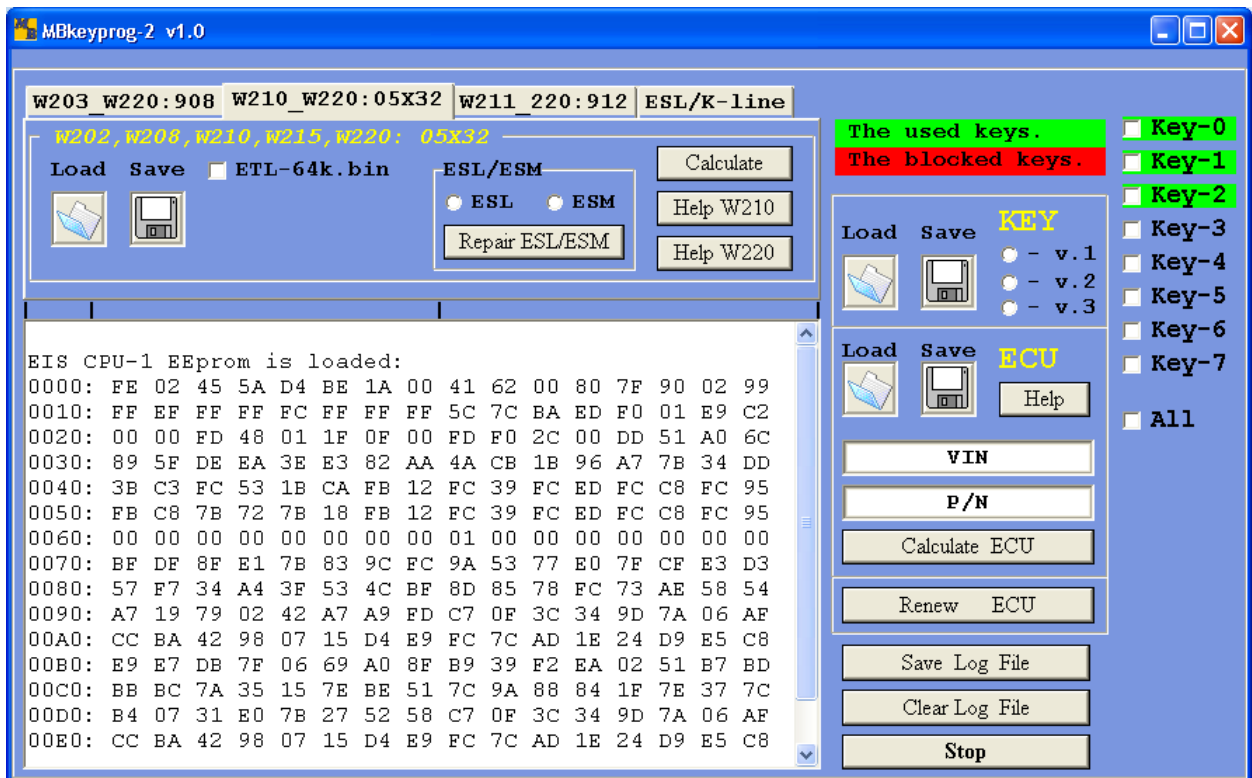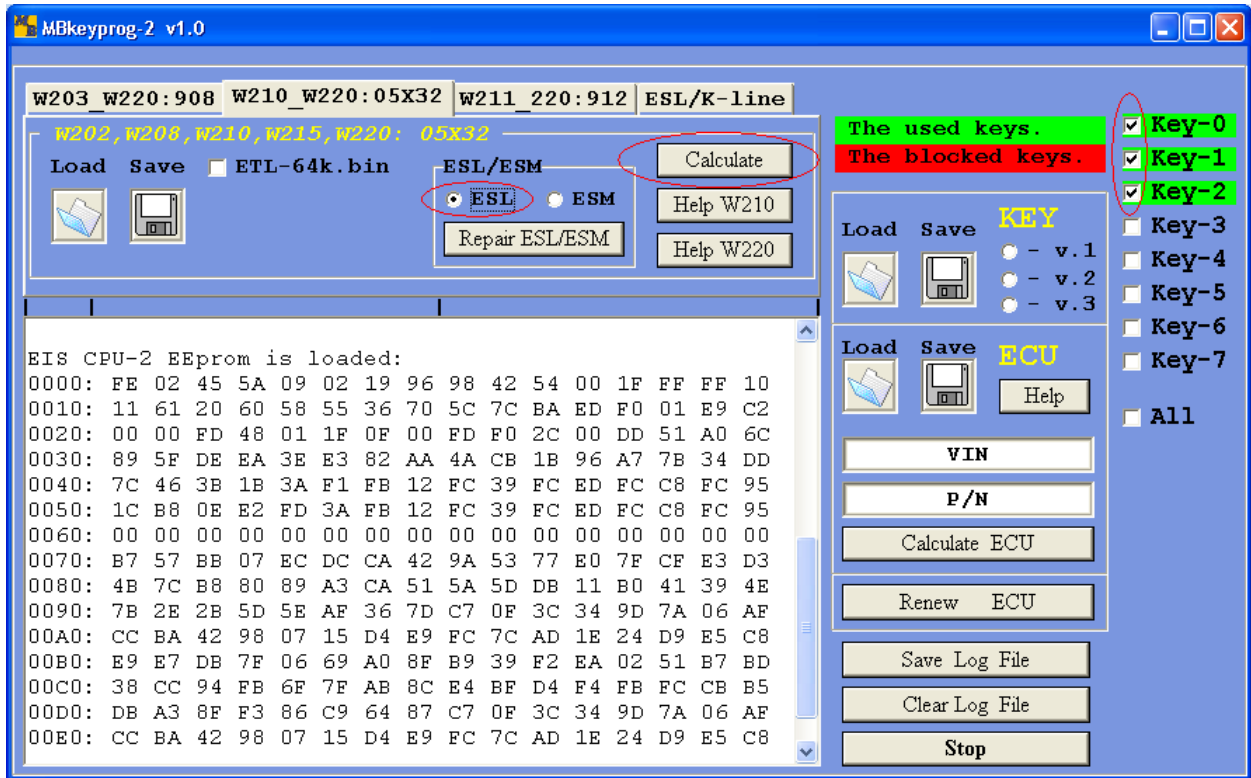
Load the previously read **CPU2** dump


After loading you see

You see that key-0, key-1, key-2 are highlighted in green. It means that three active keys are written in this EIS. There are no blocked keys.

Actually, you can write a new key to any position you choose. But you need, in this case, one or several original keys, you need to know the key number to write a new key to its place. It is easy to learn the number of the active key by reading it in the program of **Mercedes NEC Key Programmer**, which is included or with the help of **MB Key Expert,** provided by our company.

Let's suppose all the keys, let's write three new keys to positions from 0 to 2.


Choose **ESL** (steering wheel lock) in **ESL/ESM** window, tick the keys and press **Calculate**, upon completion you see
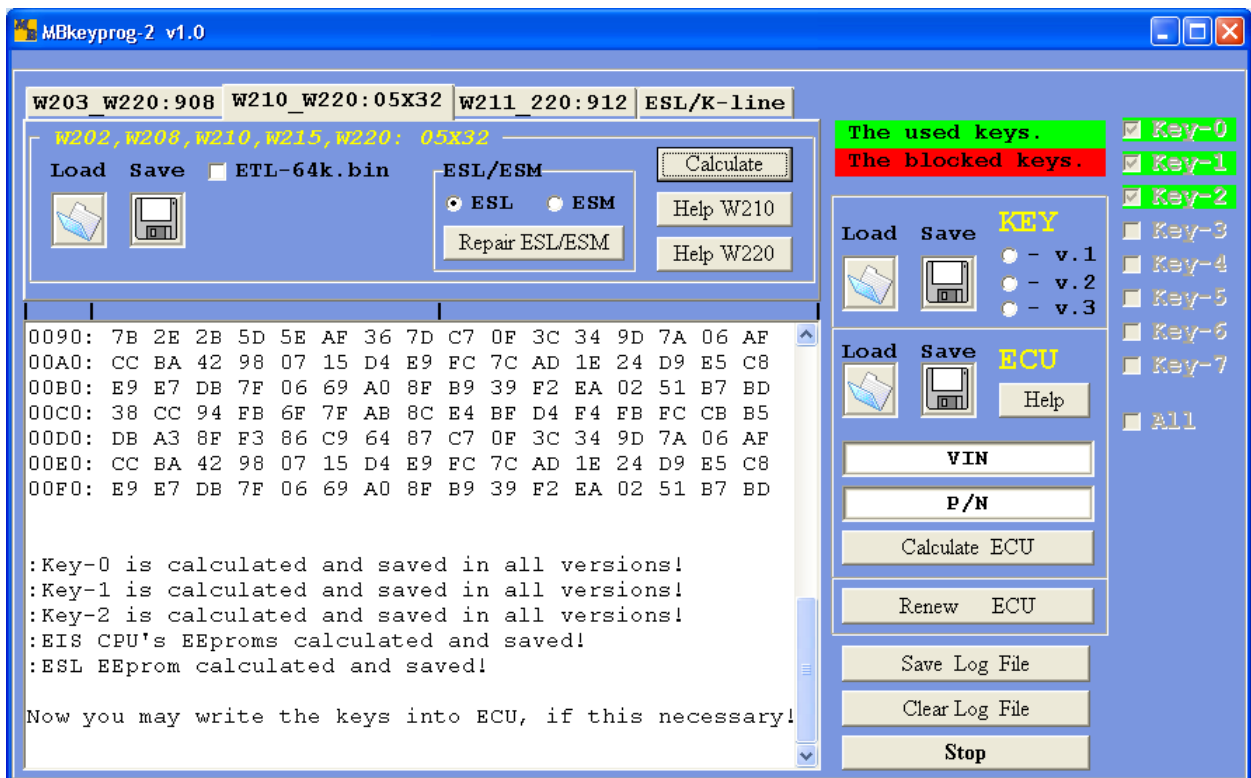

The following dumps will be automatically (!) saved to the same directory where the previously read **EIS** processor dumps have been loaded from. The new **EIS** processor dumps **EIS_CPU-1_NEW.bin** and **EIS_CPU-2_New.bin**, the new dump **ESL** (steering wheel lock) under the name **ESL_New.bin** and the three new keys dumps in three new versions (you may read about the key dump versions at the end of this manual) under the names **Key-0_v1.bin**, **Key-0_v2.bin**, **Key-0_v3.bin**, **Key-1_v1.bin**, **Key-1_v2.bin**, **Key-1_v3.bin**, **Key-2_v1.bin**, **Key-2_v2.bin**, **Key-2_v3.bin**.

Now you may generate a new ECU dump where our new keys will be "located". To do so load the previously read ECU dump in ECU window (after you have chosen the necessary version)
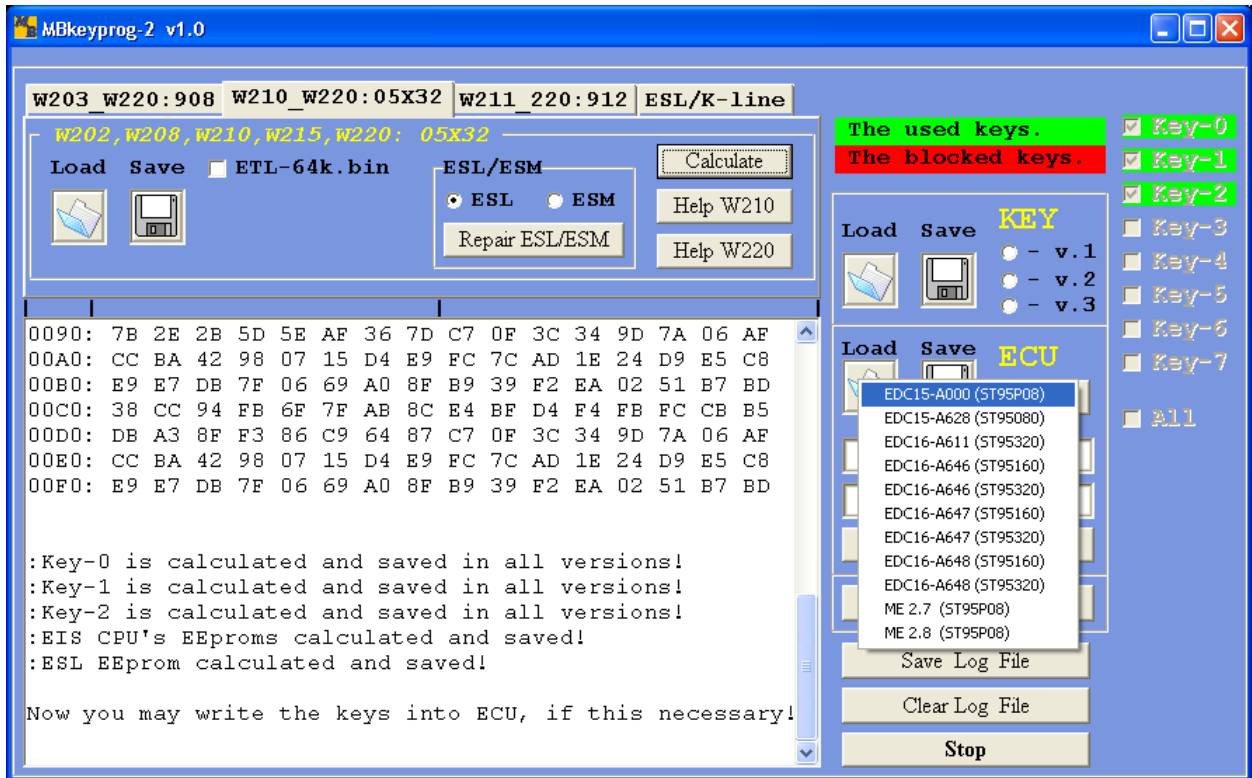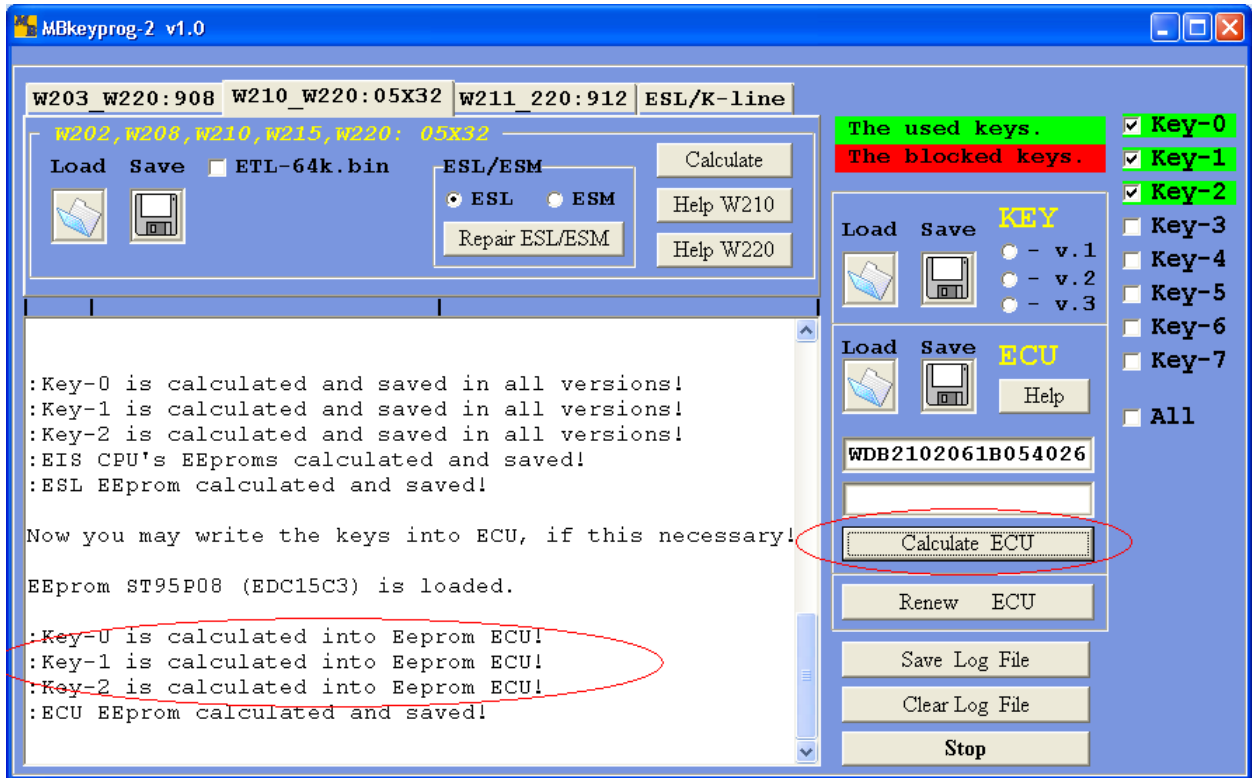

If the loading is successful you see
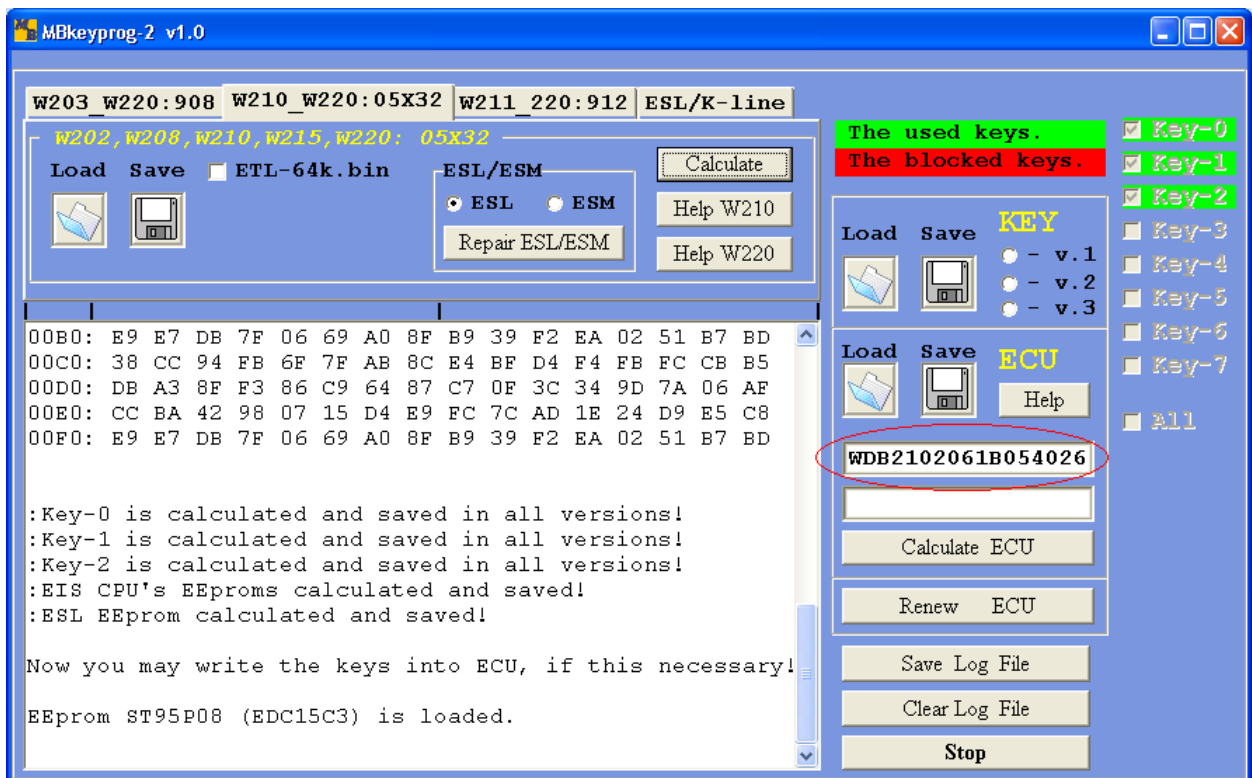
If the right dump has been chosen while loading, you will see at the least the right VIN-code. If the field of the VIN-code is empty you have chosen the wrong version while loading the file.
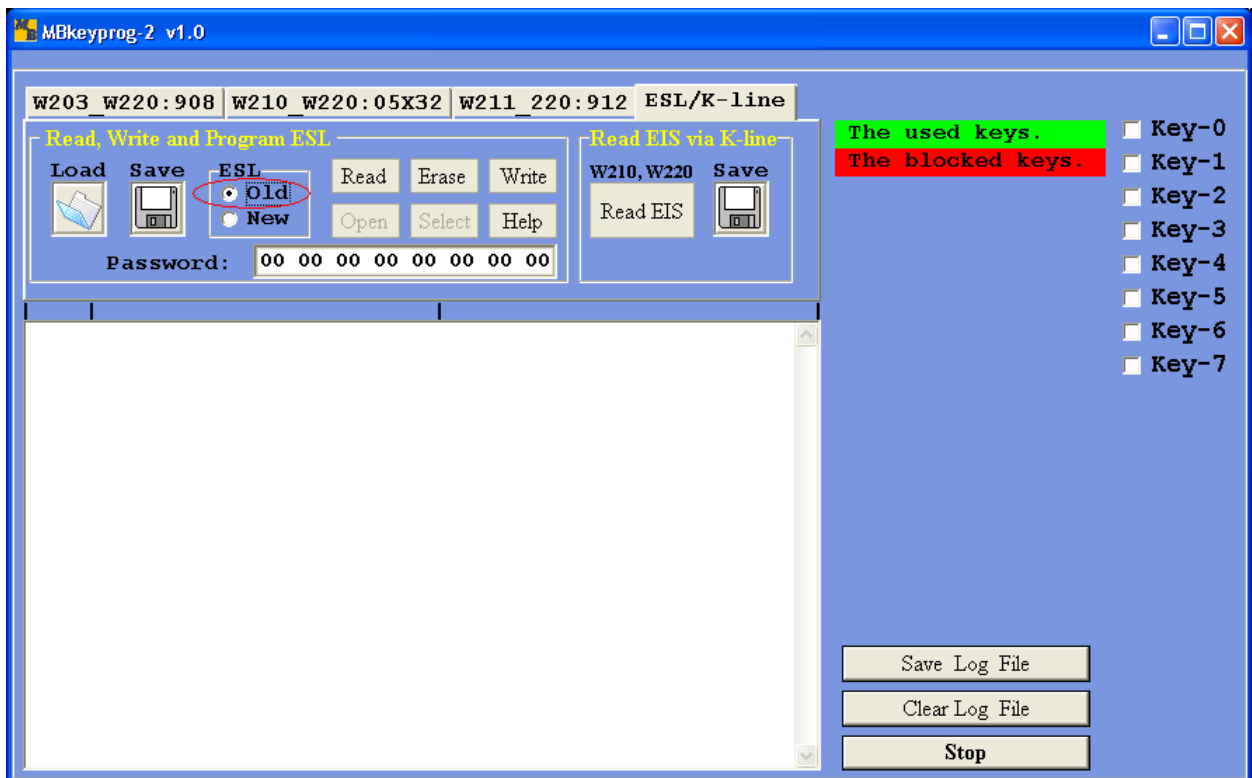
Press **Calculate ECU**, you see

The new ECU dump is automatically saved in the new directory with _**New** added to its initial dump

Now you see all the dumps for programming EIS processors, the three keys, ECU and ESL (steering wheel lock).

3. Operation with bookmark ESL/K-line (Old).

You must distinguish between the old and new types of ESL (steering wheel lock)! Below you can see the old type of ESL which was used in models W202, W208, W210 the years of production up to 2000.

In some rare cases (the most recent years of production) the ESL had a new type microchip while they were in the old type box. Actually these types differ by a number of electrical, software and mechanic characteristics. We'll study only one. There are two processors in the old type ESL (**CPU3** and **CPU4** in our classification**),** which are not protected by a special password and can be erased. You should erase them before the procedure of writing the new dumps to these processors. If while working with the old type ESL (visually) you find out that a fast erasion is not possible choose **ESL** type **NEW** and continue to work as if with the new type which is described below.

In this example we deal with a usual old type ESL.

With the help of our device we can read the contents of **CPU1** and **CPU2** EIS processor, as well as the contents of **CPU3** and **CPU4** ESL processors through the diagnostic connector. These dumps are not full but we can use them as back-up.
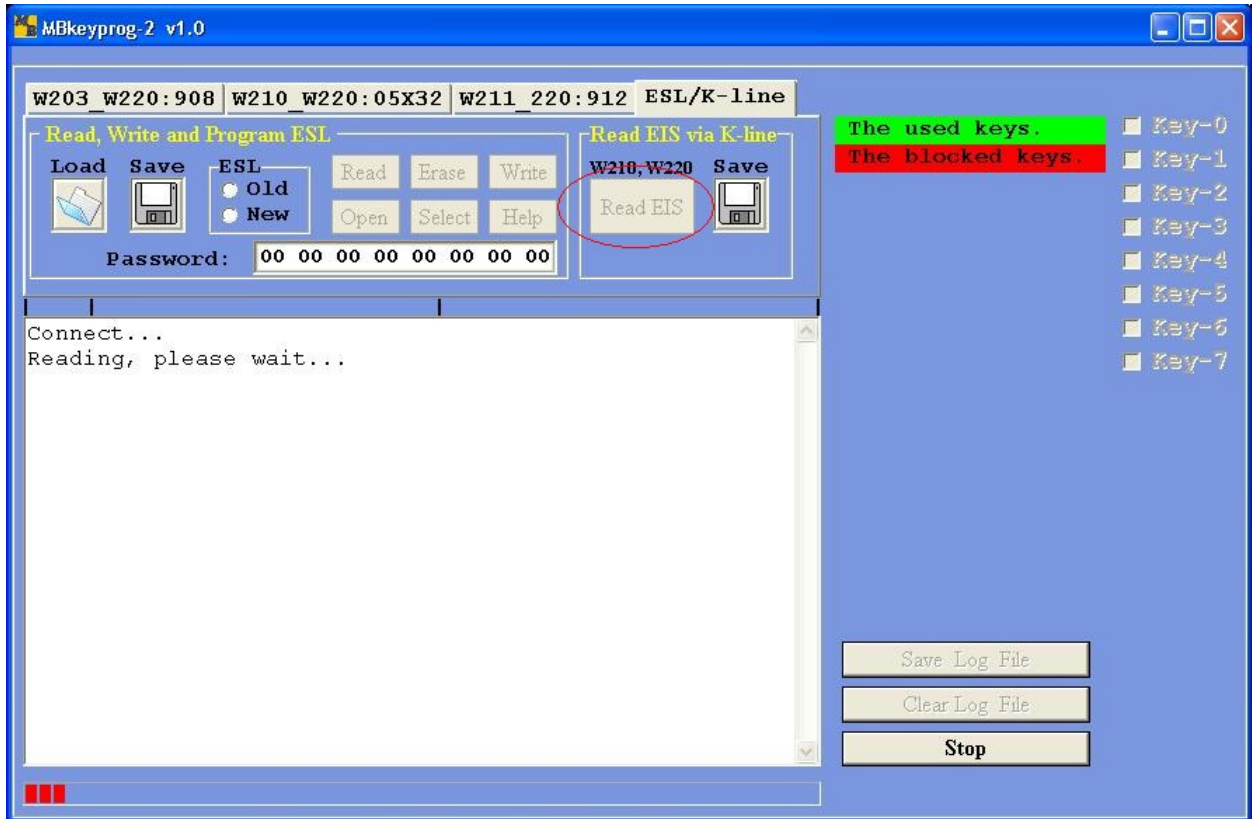
Connect the diagnostic connector.

To read through the automobile diagnostic connector the switches on the socket must be in the following position
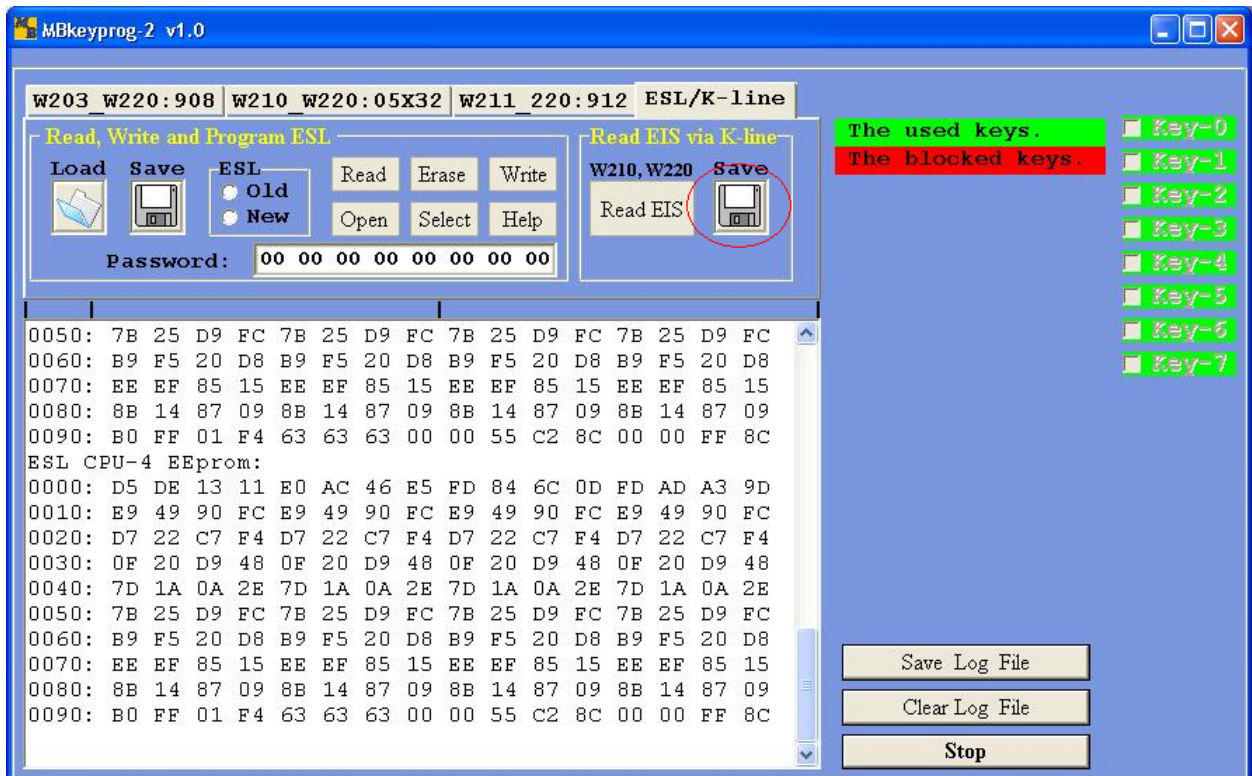

Before the procedure of reading you must insert the faulty key in the EIS (another auto key, the bottom of a disposable lighter any object which matches the size).
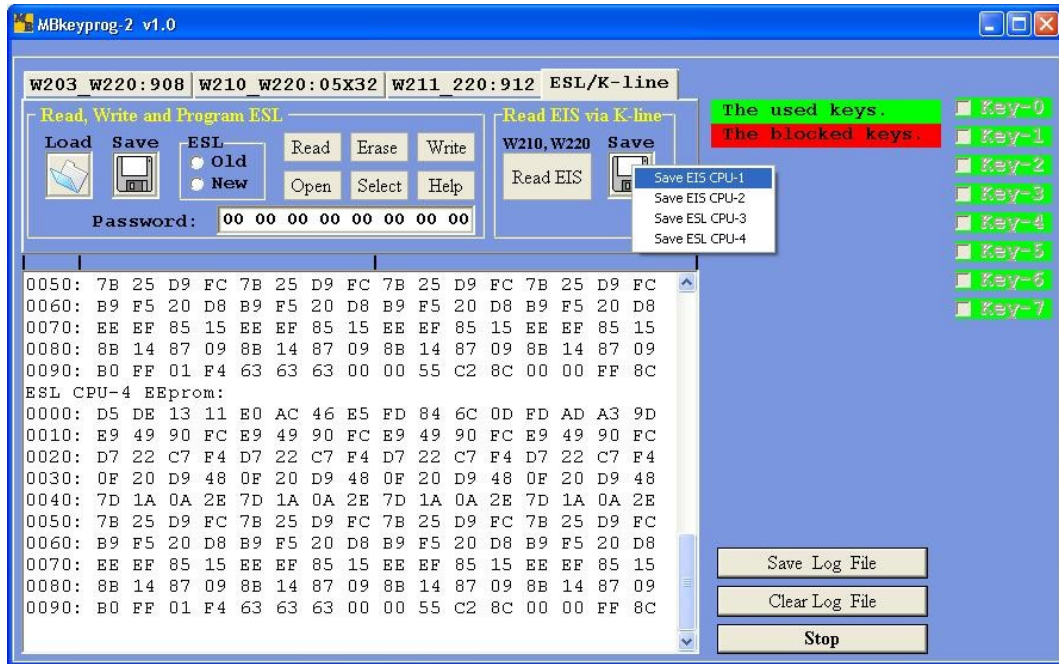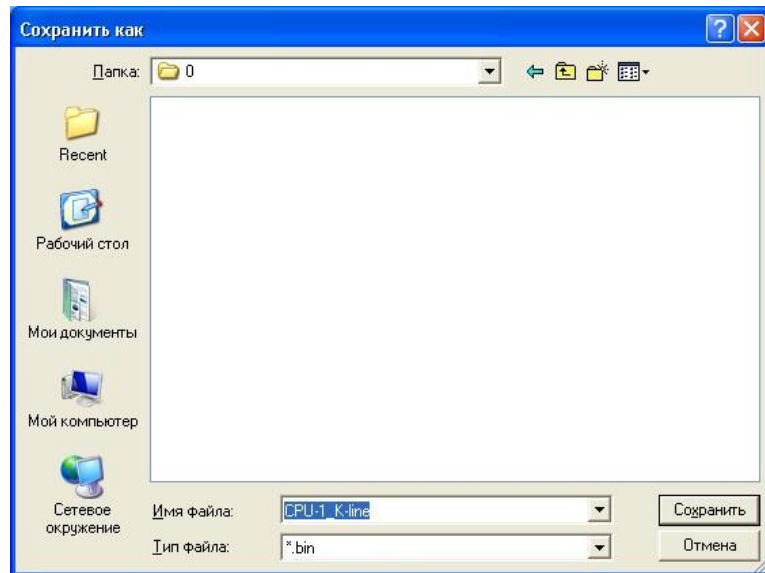
Press **Read EIS**

Upon completion you see

Press **Save** and save the read dumps one by one to the hard disk of your computer


File name is given automatically!

Disconnect the ESL connector and connect the appropriate connector from our set. **If you have not done the previous reading** through the diagnostic connector we recommend to read and save the original ESL dumps to the hard disk of your computer.

To read and later write CPU3 processor the switches on the connector must be in the following position.

Press **Read** – the process of reading **CPU3** processor has begun
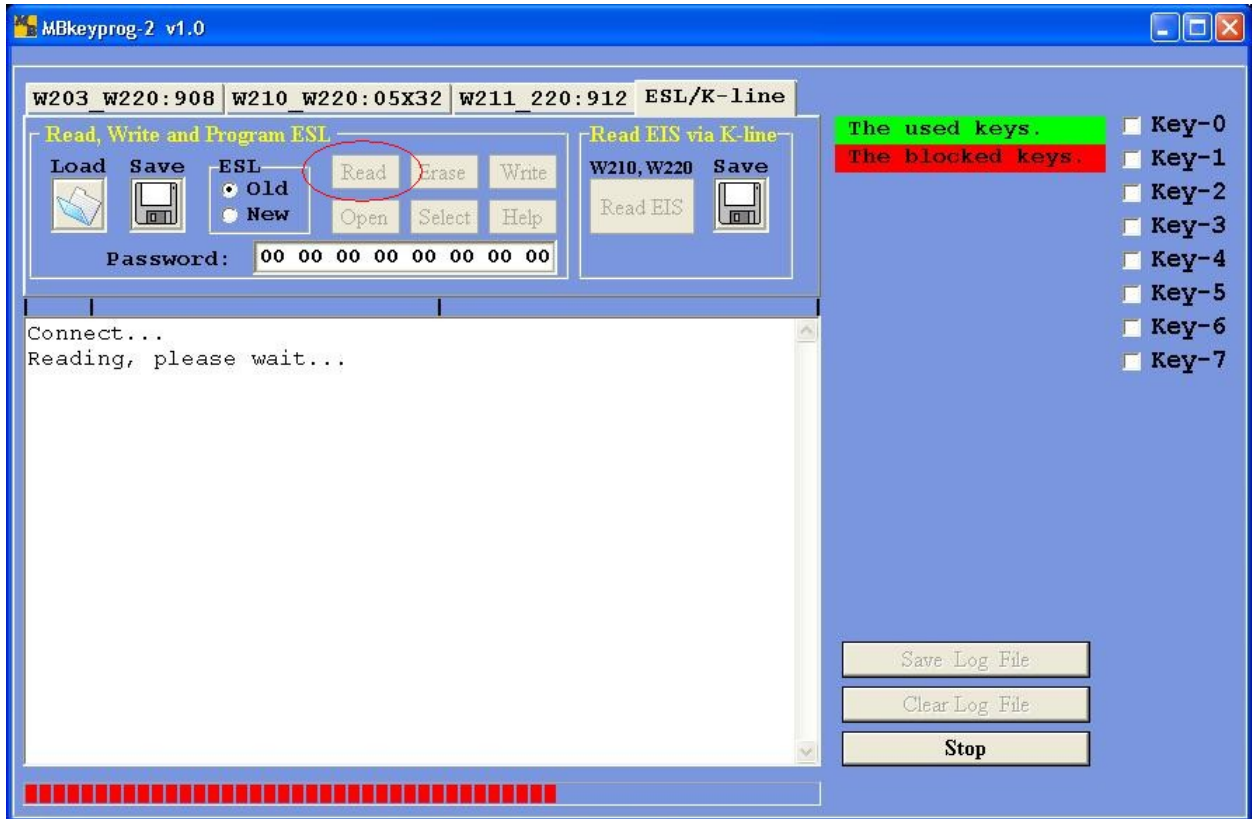
Upon completion you see
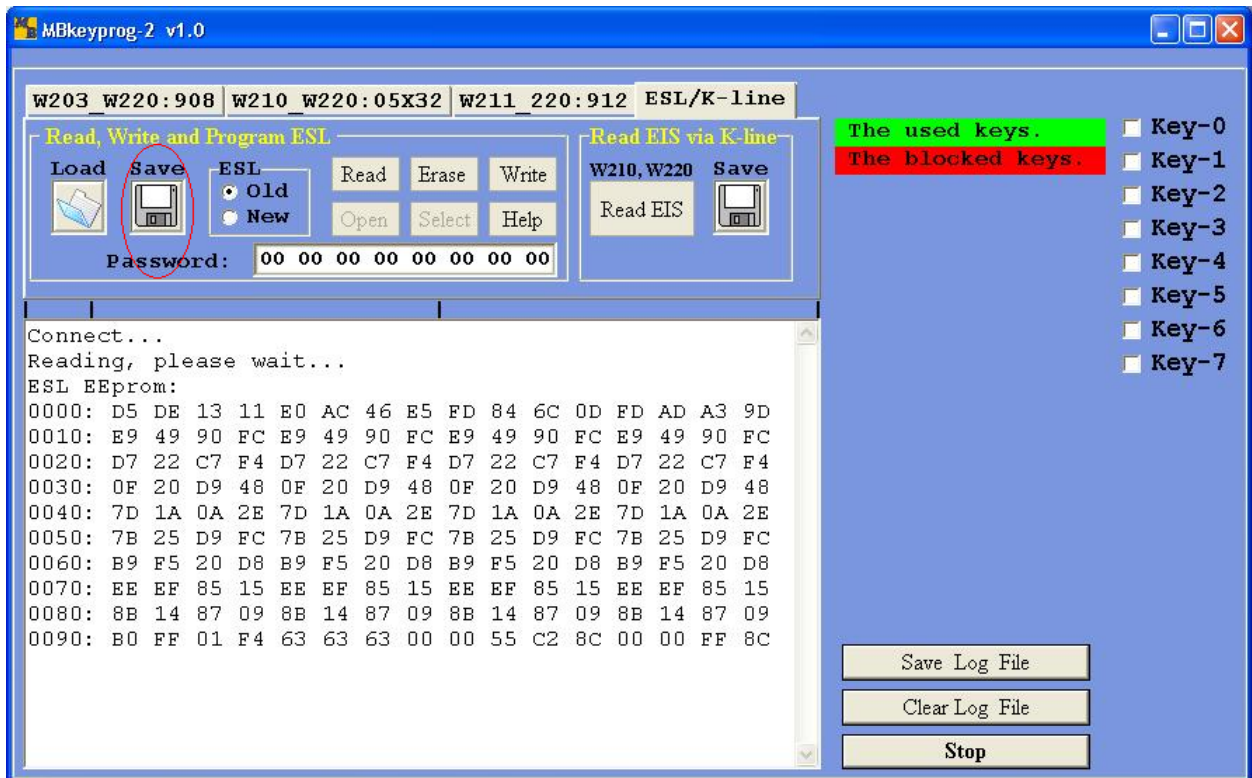
Press **Save** and save dump to the hardware

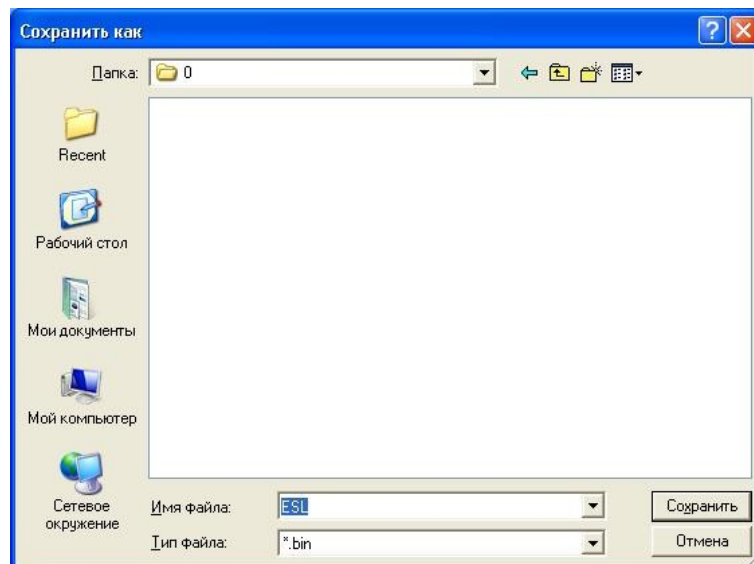In this case you must add **3** to **ESL** name

To read the contents of **CPU4** processor you must move the switches on the connector to the following position

Press **Read** – the process of reading **CPU4** processor has begun

Upon completion you see

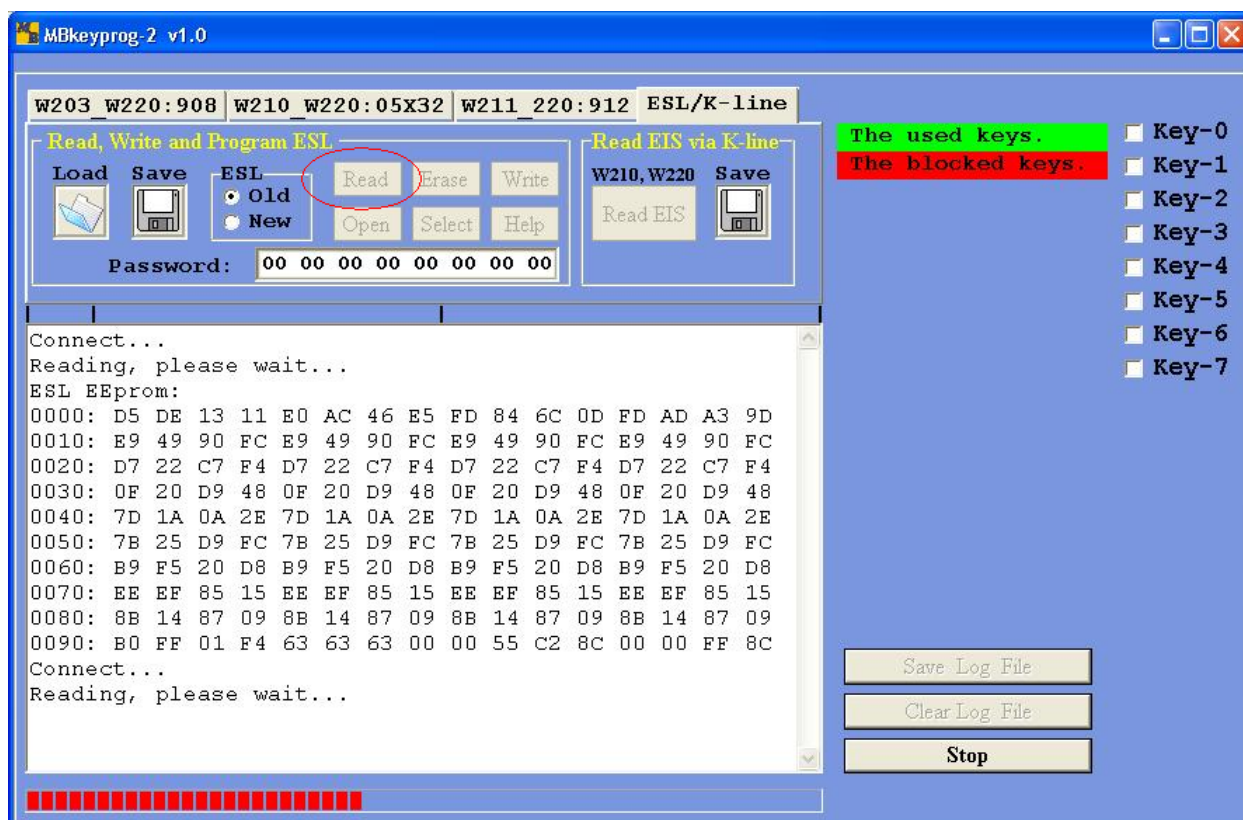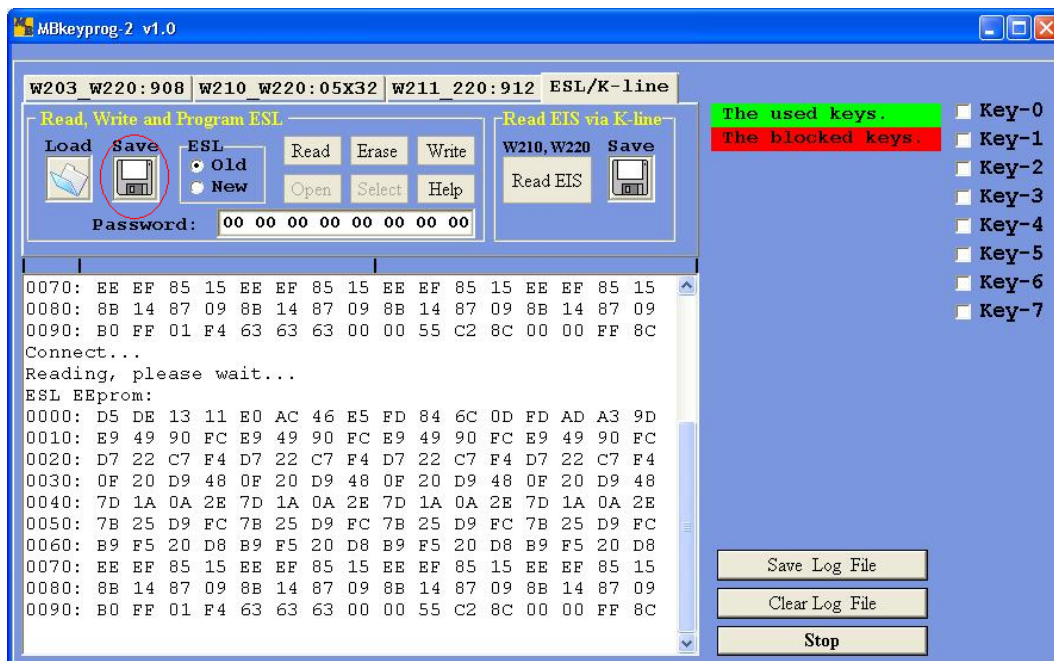Press **Save** and save the dump to the hard disk
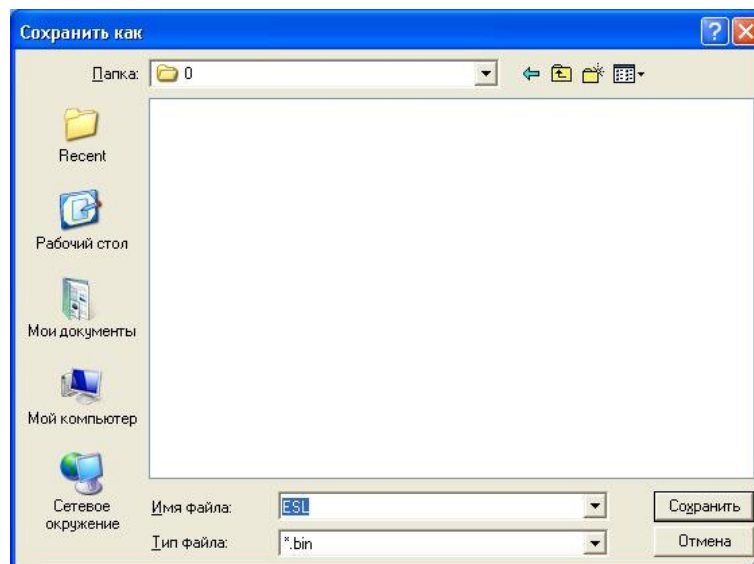
In this case add **4** to **ESL** name

After you have saved the original dumps start the procedure of erasing. Move the switches to the position to work with**CPU3**

Press **Erase** button and see
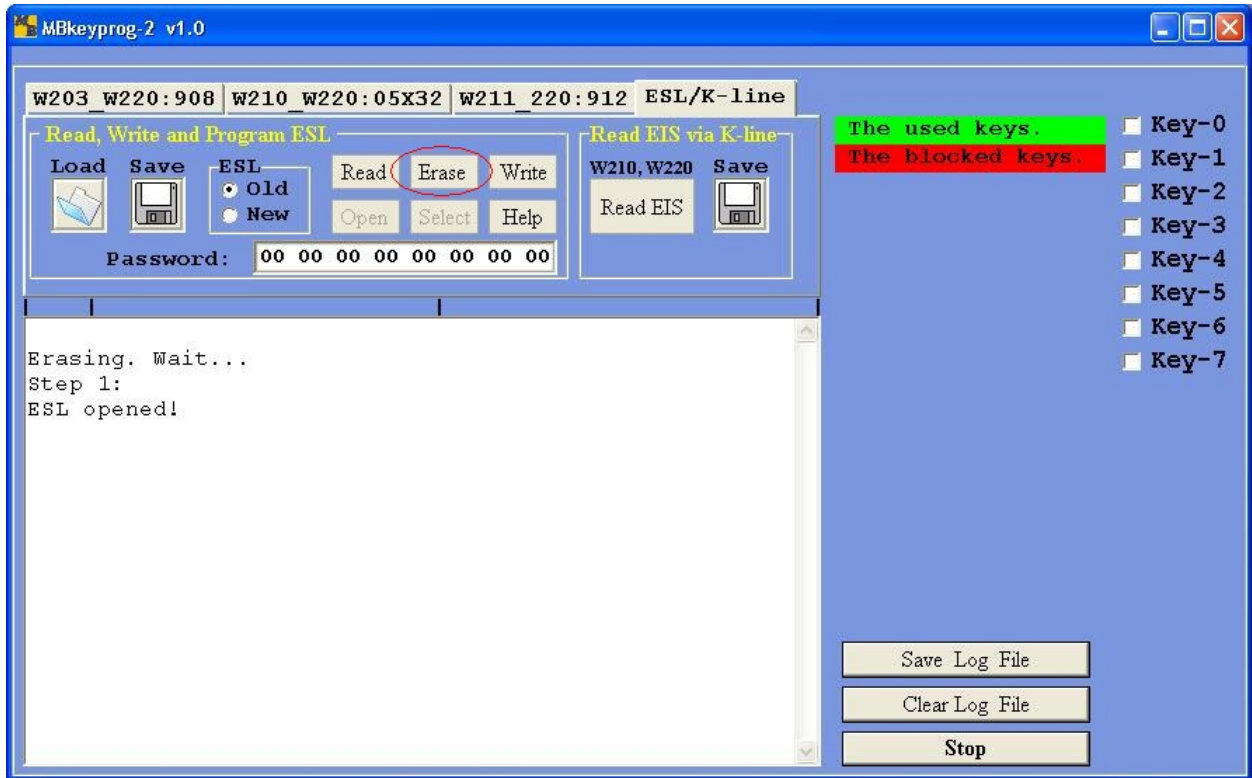
After the contents of **CPU3** processor have been erased the ESL must unlock the steering column. The vehicle can be rowed!

Press **Load** and upload **ESL_New** dump which has been generated earlier to the program
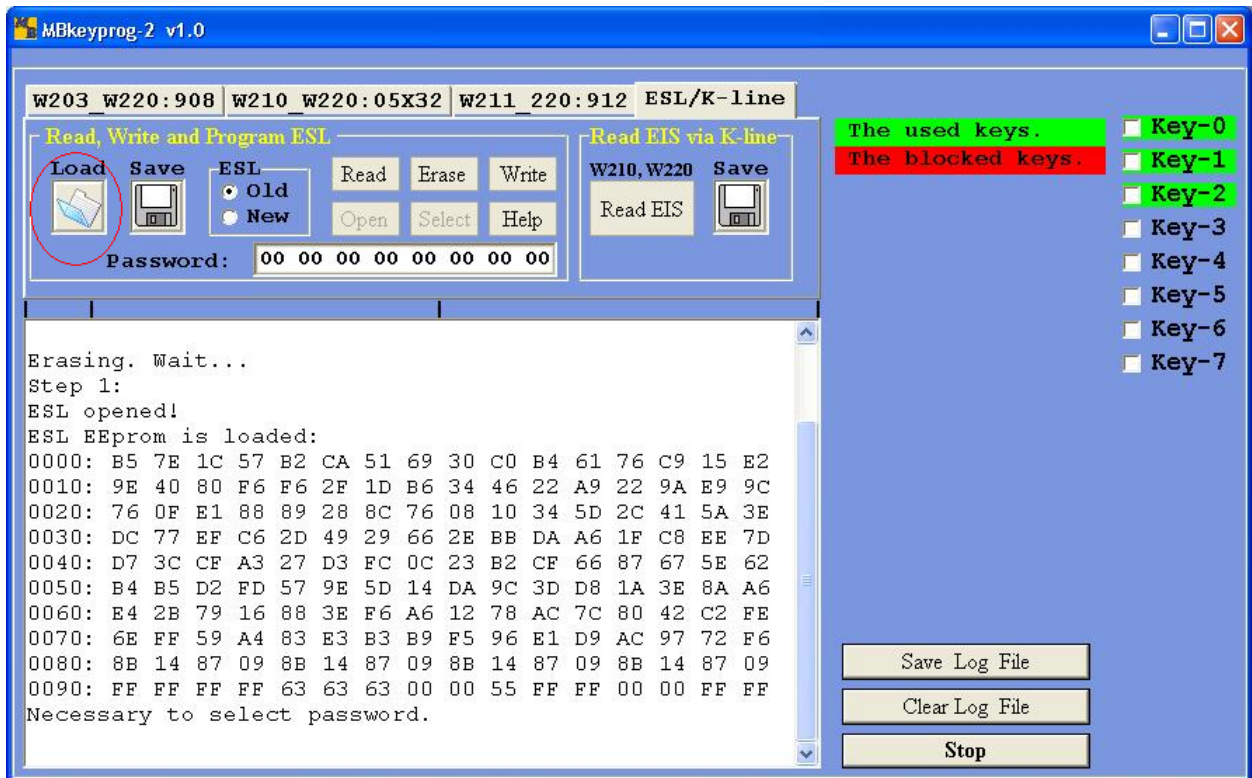
Press **Write**, you see
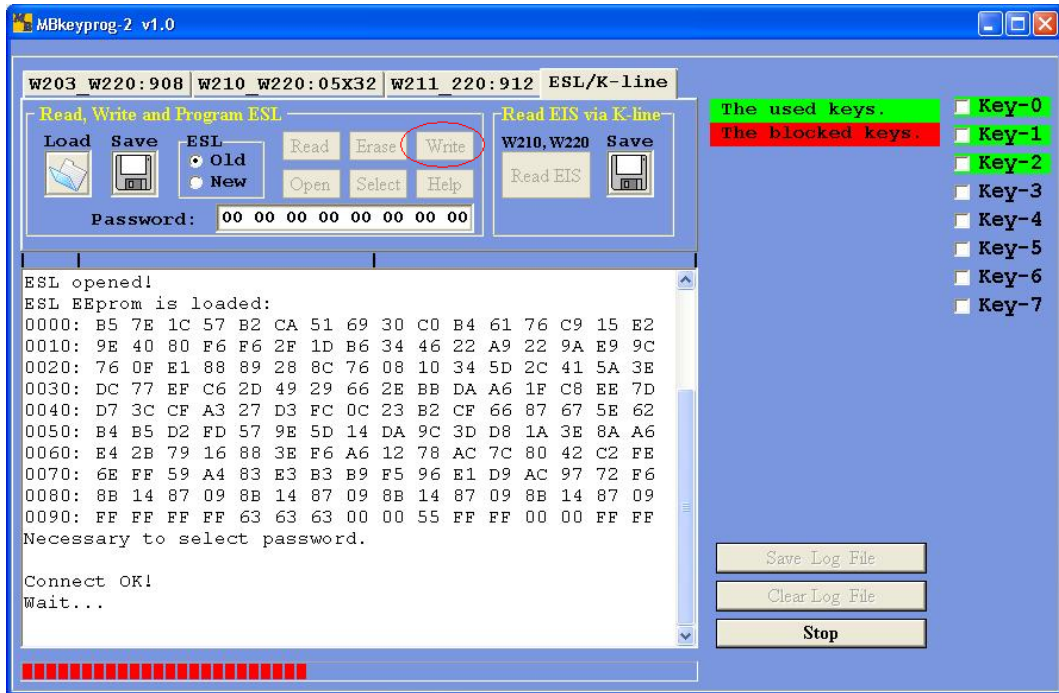
Upon completion you see
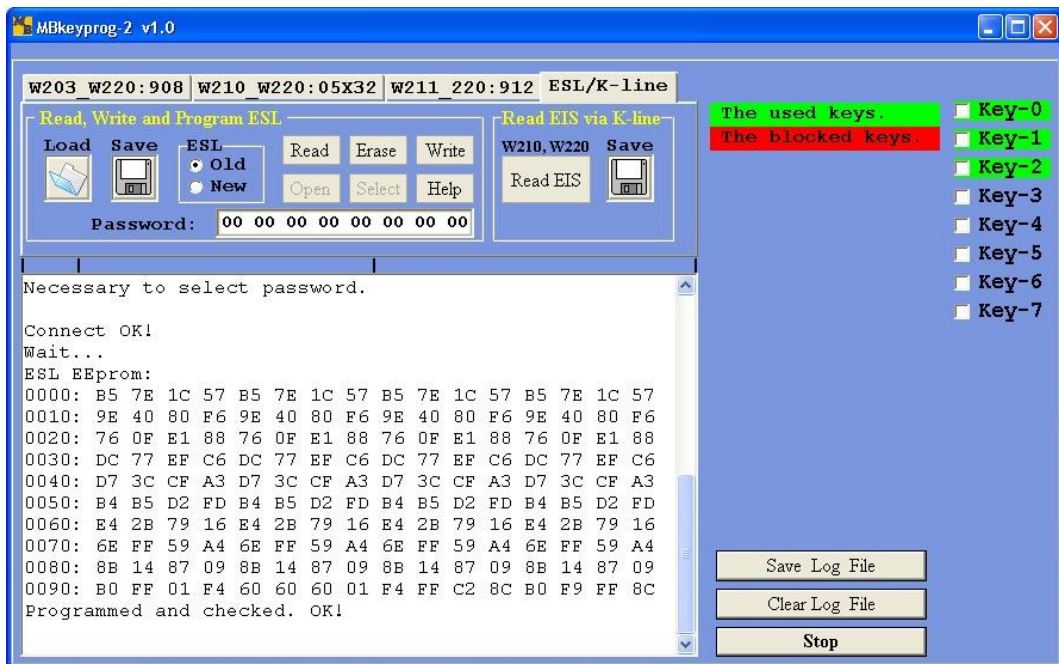
Move the switches to the position to work with **CPU4**

Press **Erase** and upon completion you see
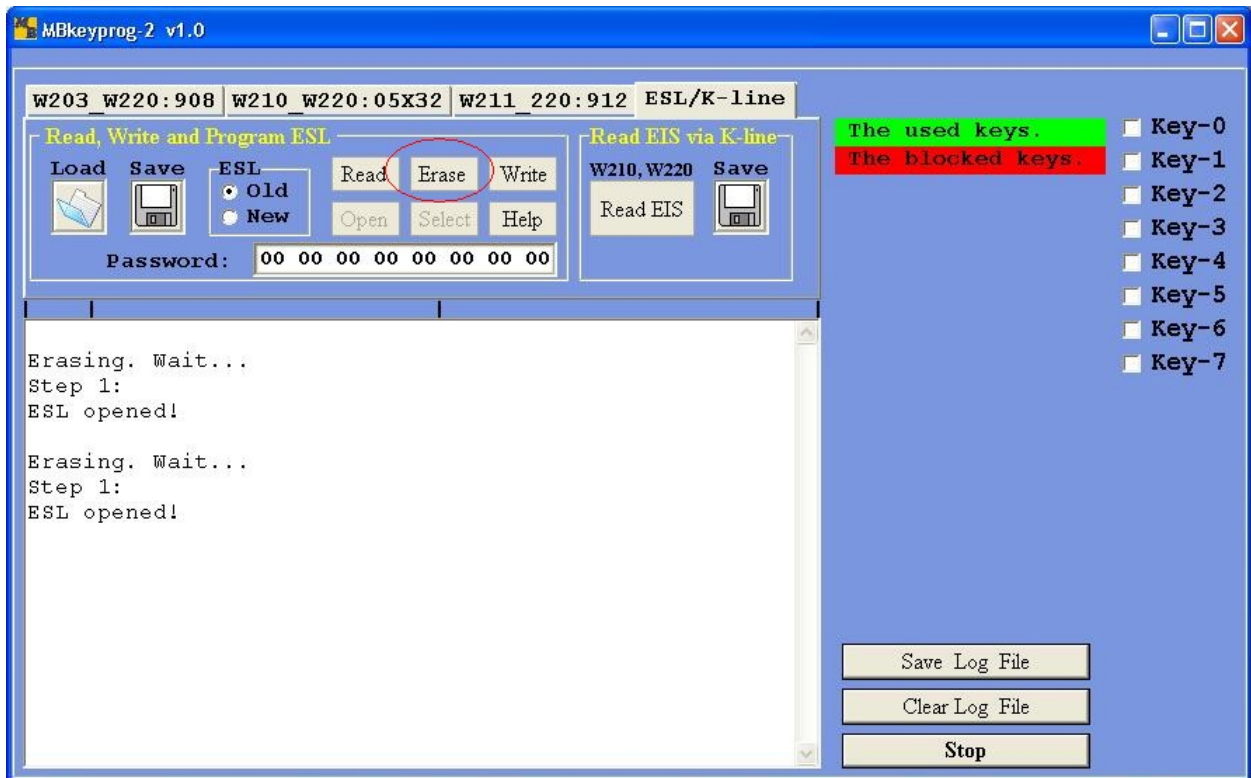
Press **Load** and load (the same) **ESL_New** dump which has been generated earlier to the program
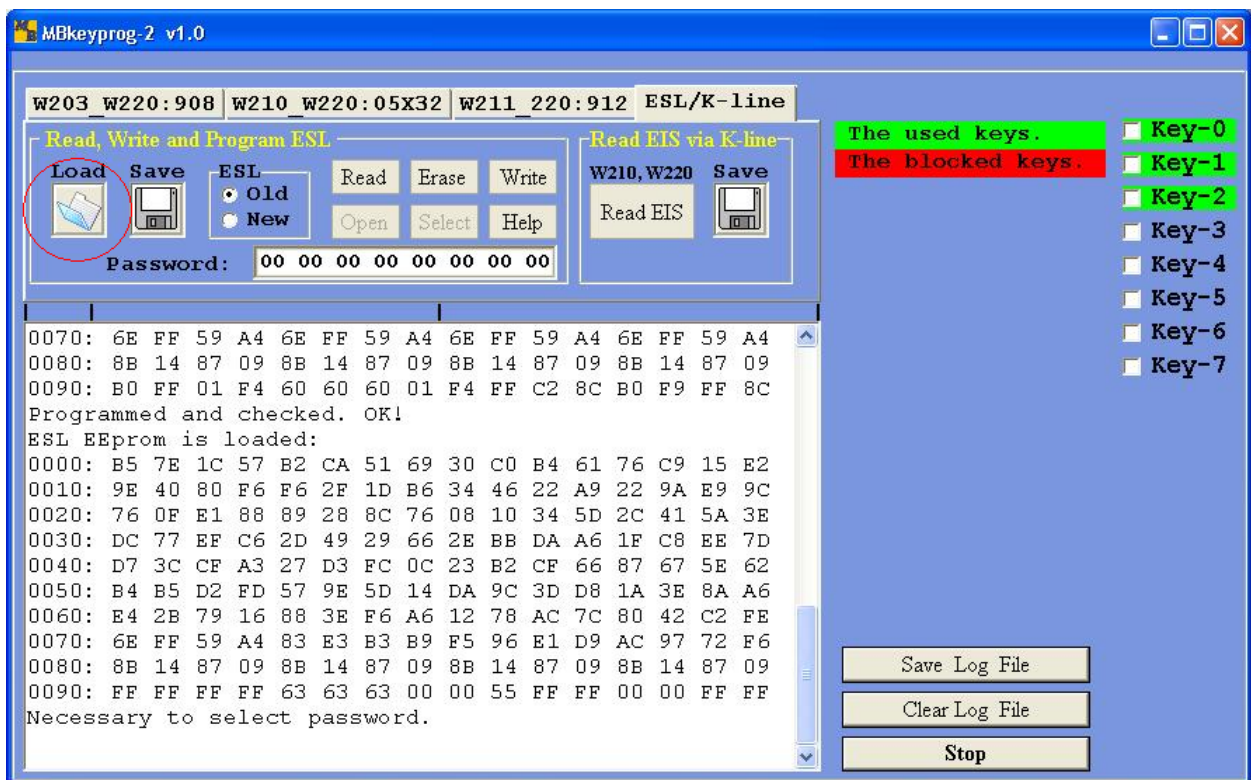
Press **Write** and see the following
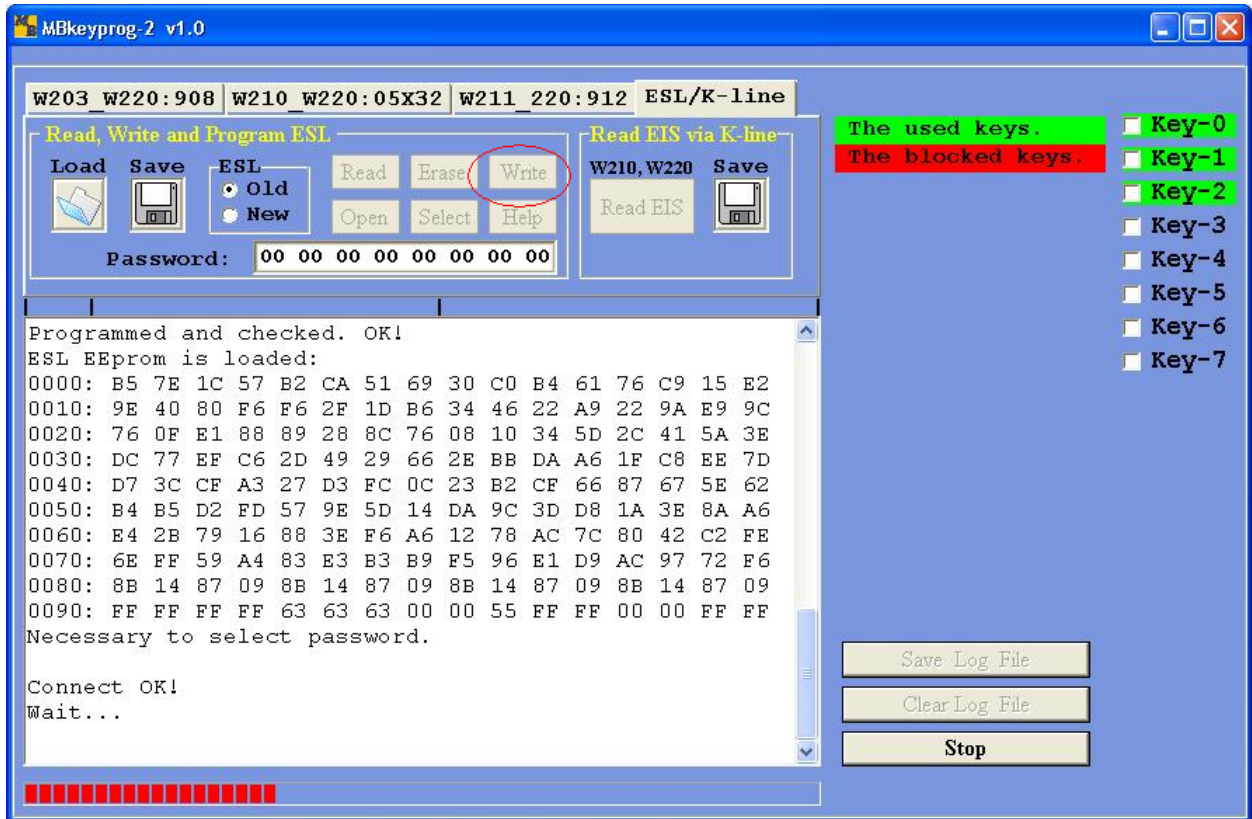
Upon completion you see
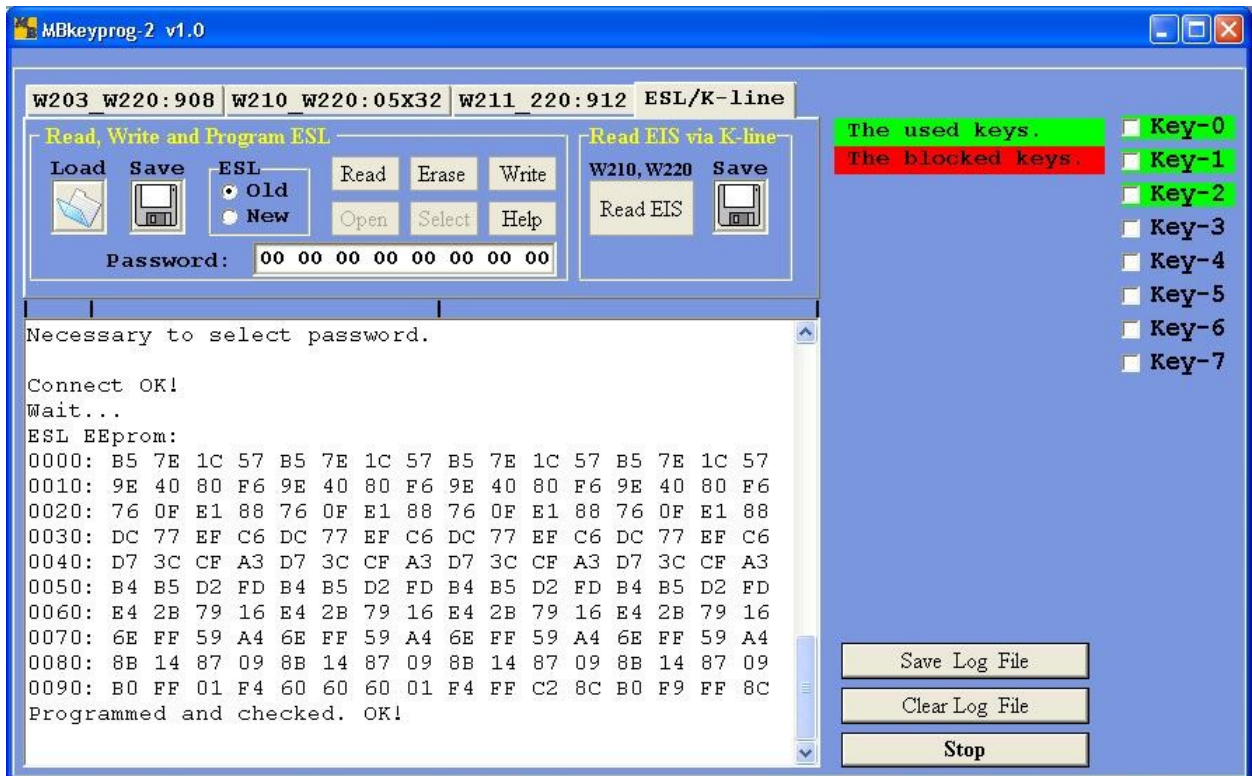
Disconnect our device and connect the ESL connector back to it

Write the dumps (which have been generated earlier and automatically saved) to EIS processors. Write the correct dump versions to the key processors. Write the dump with the written keys to the ECU (it's actual only for "res-

tyled" W210s, keys couldn't be written in older models in their ECUs – they had a "characteristic" of ECU matching this EIS).

You may need to insert the key in the EIS several times (up to 32!), till the key is "accepted". Normally you succeed the first time.

Return the car to the client!

4. Operation with bookmark W211_W220:912.
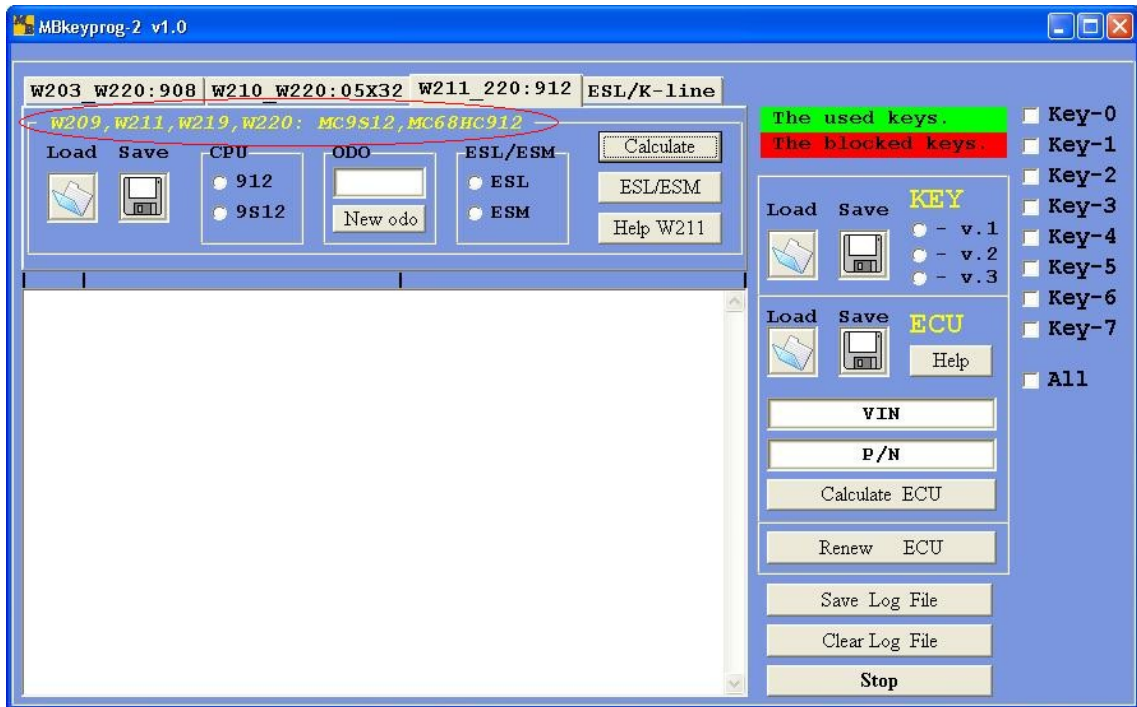
The cars which have **MC9S12** processor in their EIS are marked in red.

How can you identify the type of processor correctly? Before, you could identify the type by the mask on the box after unsoldering the processor. Now many use the programmers for in-circuit (onboard) programming (without unsoldering), e.g**. Rosfar** programmer.

Disassemble the EIS. You see on the main board **ST 12** inscription
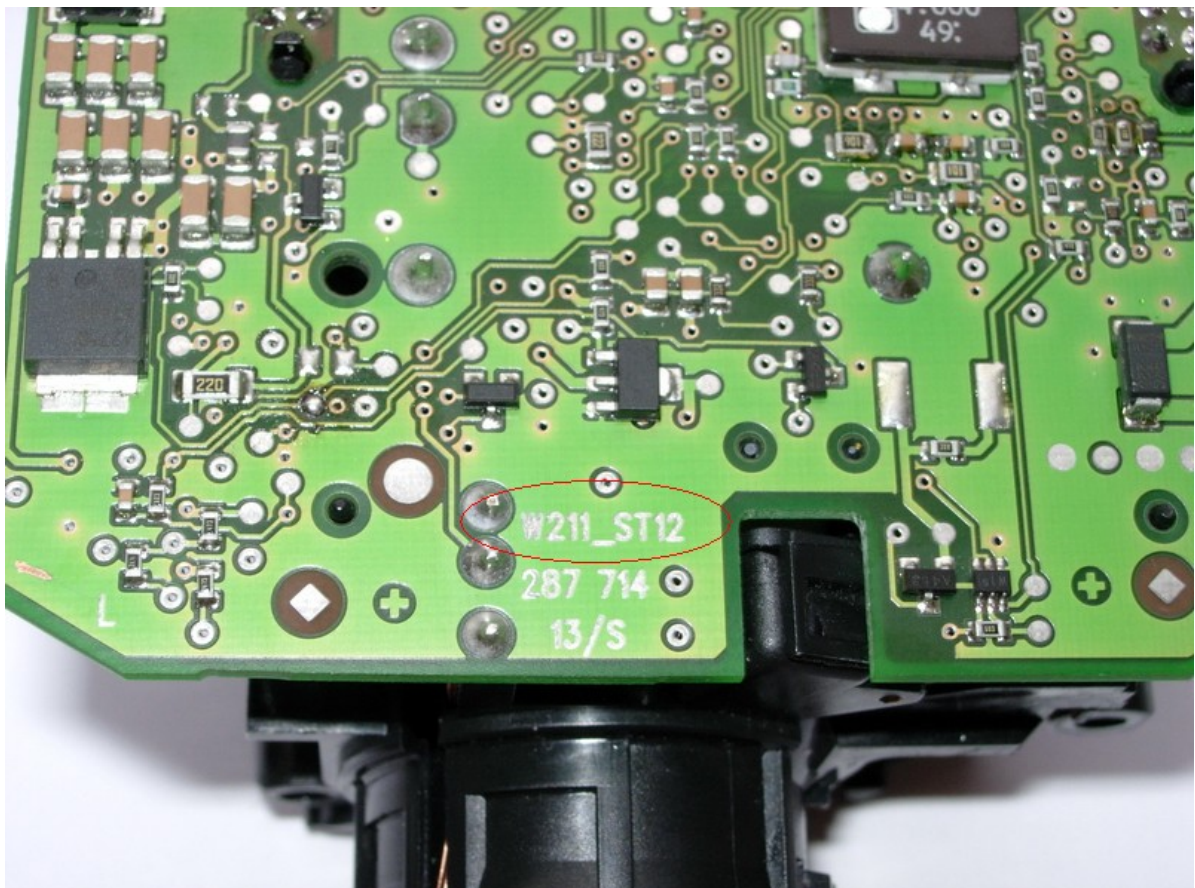
It means you should choose **9S12** type of the processor in your program window.

If you s**ee HC12** inscription on the board
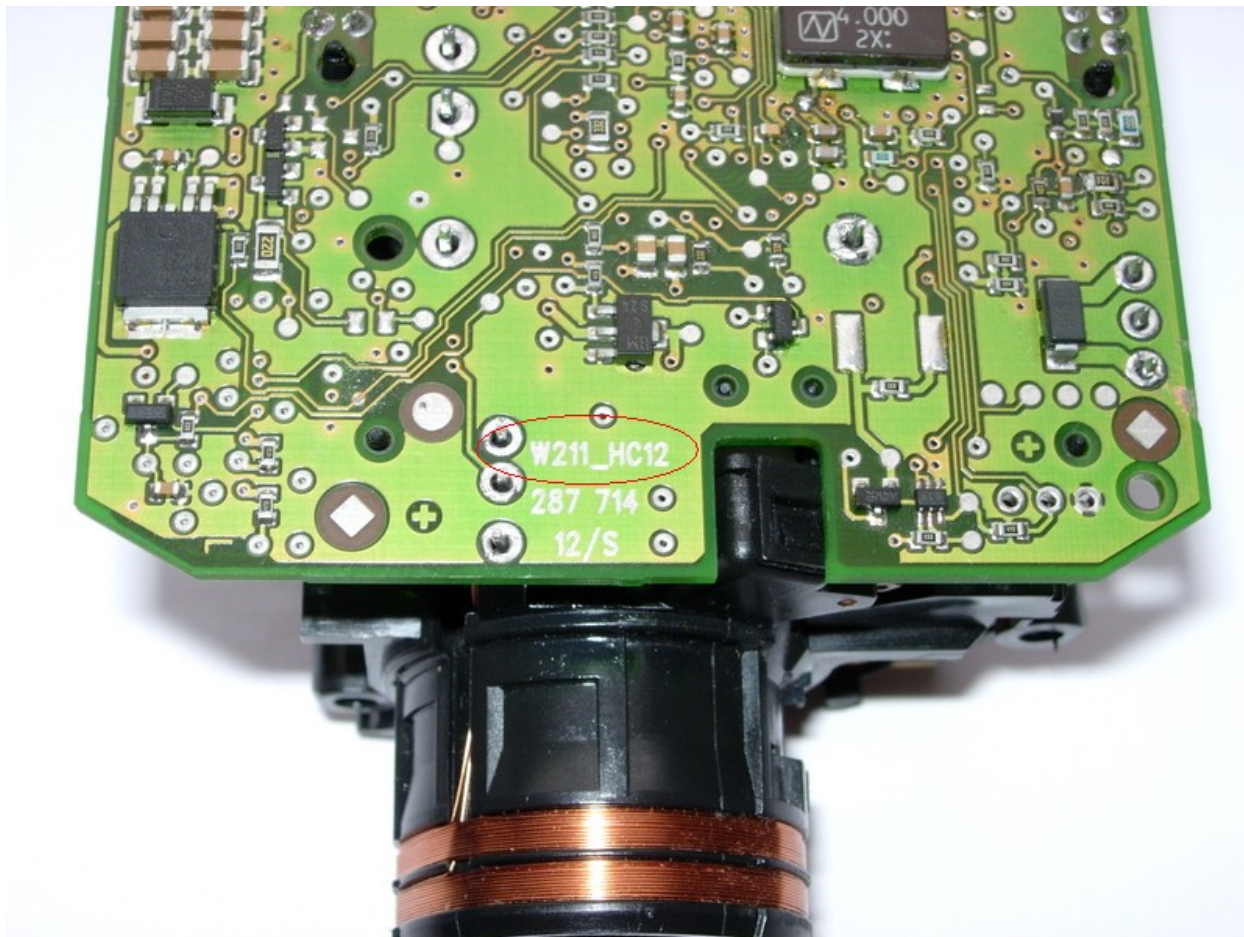
it means you should choose **912** processor type in your **CPU** program window

Let's study the work of the program with **9S12** as an example. Chose according processor in CPU window. Upload dump has been read from EIS.
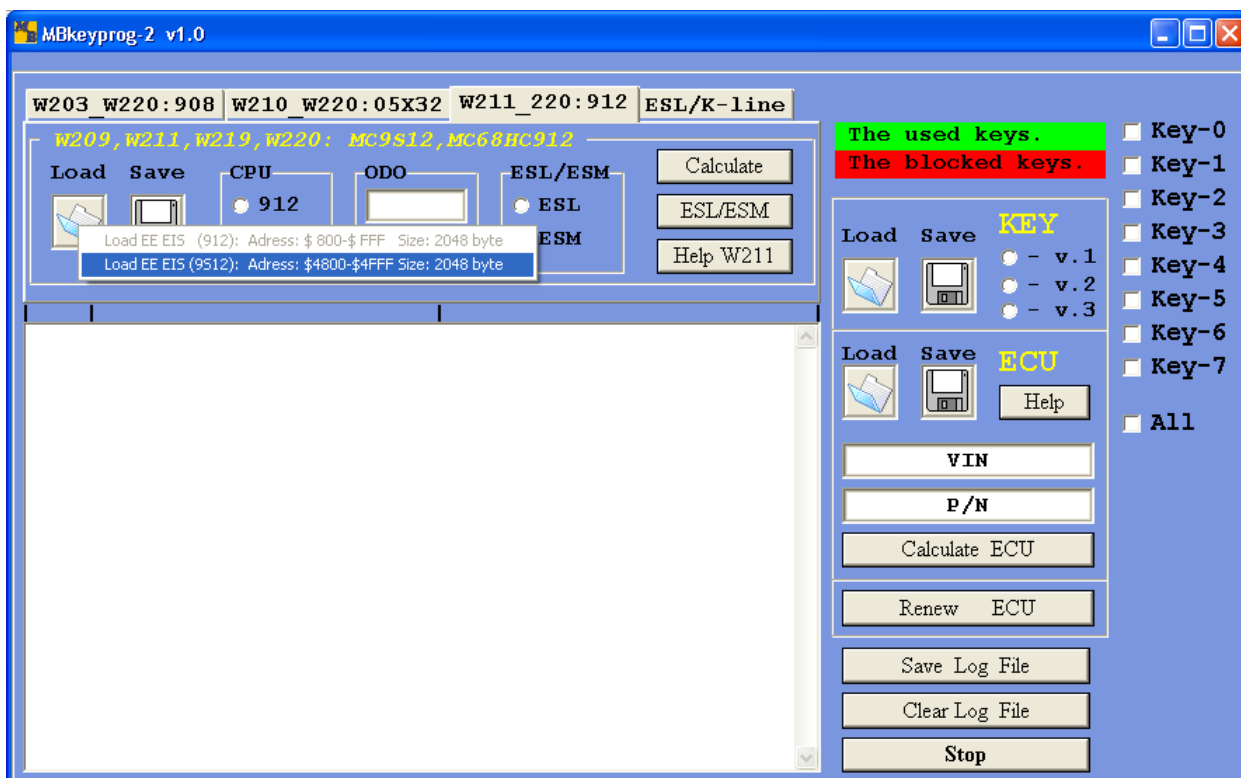
Upon loading completion you see
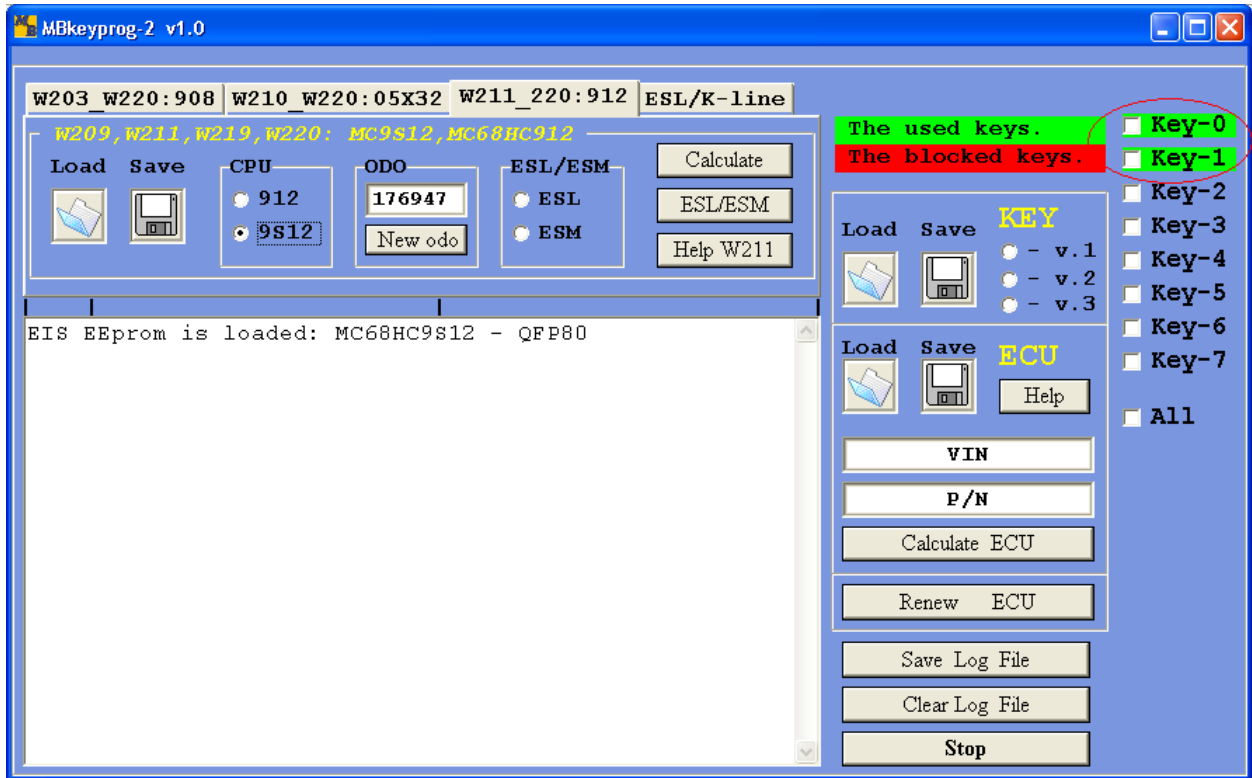
You see that two active keys are written at 0 and 1 positions. Let's assume we have to write a third key to position 2. Tick position in front of **Key-2**.

As in our example we work with Mercedes W211 we choose **ESL** in **ESL/ESM** window.

Press **Calculate**
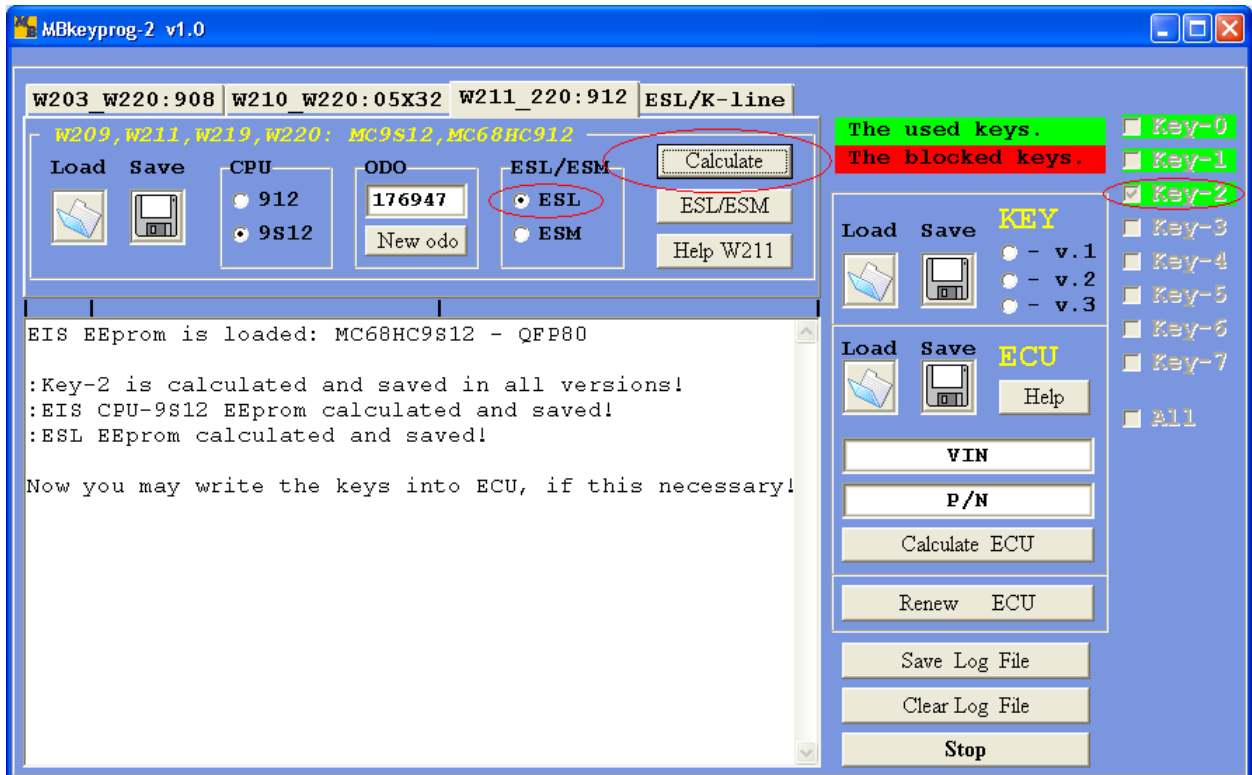
In the initial directory (where we loaded the EIS processor dump from) automatically (!) the following dumps are saved. The new dump **EIS_CPU-9S12_New.bin,** the new ESL dump **ESL_New.bin,** the new key dump in three versions (you can read about the key dump versions at the end of this manual) **Key-2_v1.bin**, **Key-2_v2.bin**, **Key-2_v1.bin.**

Now you can generate a new ECU dump, where our new keys will be located. To do so load the previously read ECU dump in the **ECU** window.
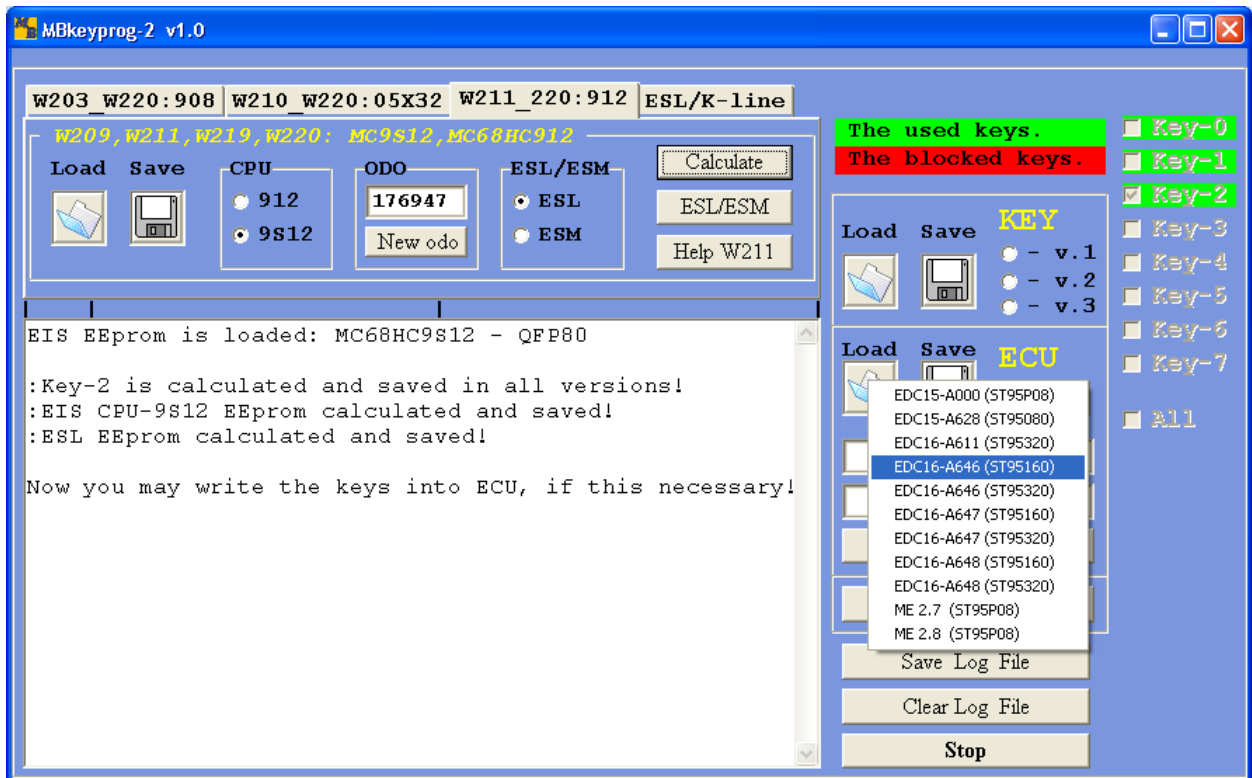
If loading is successful you see
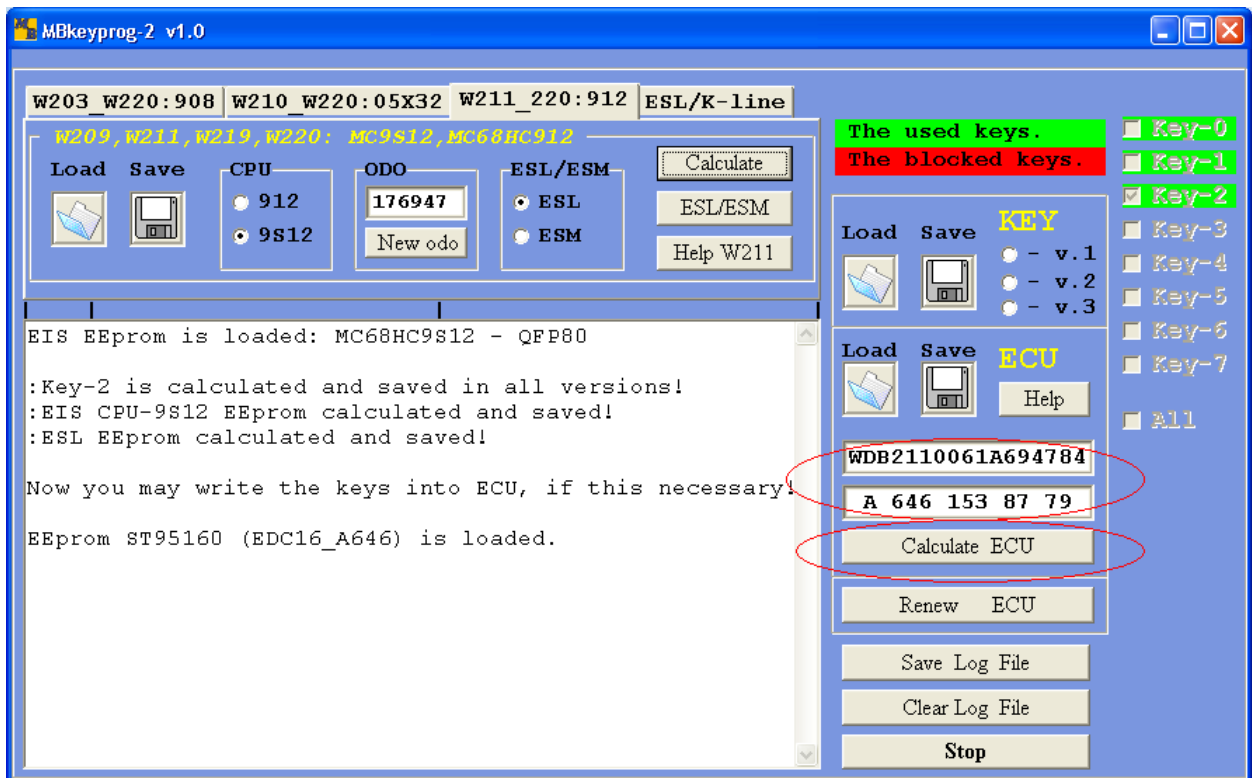
In the circled windows you see VIN-code and the factory number. If the correct dump has been chosen while loading you will see the right VIN-code . If the VIN-code field is empty it means you have chosen the wrong version while loading. Press **Calculate ECU** and you see.
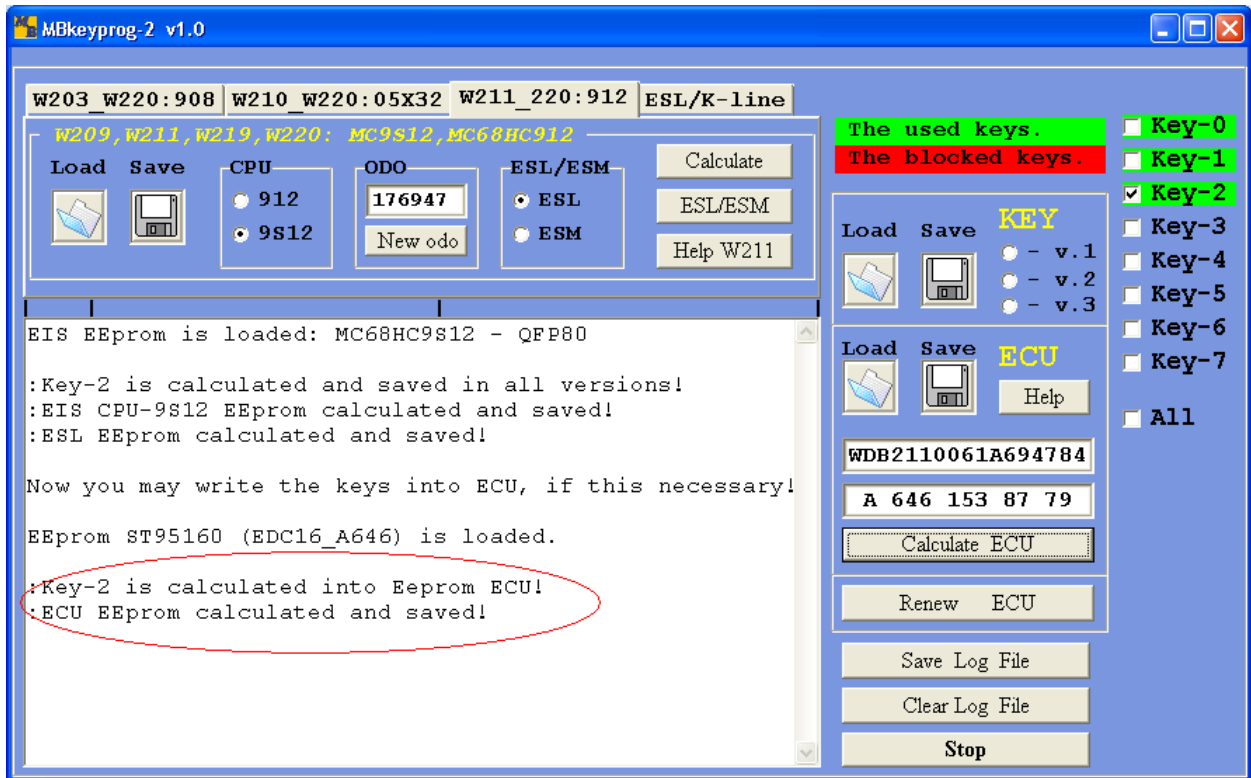
The new ECU dump is automatically saved in the initial directory with adding **_New** to its initial name.

Now you have a new dump for EIS processor programming, new key programming, ECU and ESL programming.

5. Operation with ESL/K-Line bookmark (New)

You must distinguish between the old and new ESL types! Below you can see the new ESL type which was used in W203, W209, W211 types.

Connect the diagnostic connector. Disconnect the ESL connector and connect the appropriate connector from our set. To work with the new ESL processor the switches on the connector must be in the following position

Press **Read,** upon completion you see
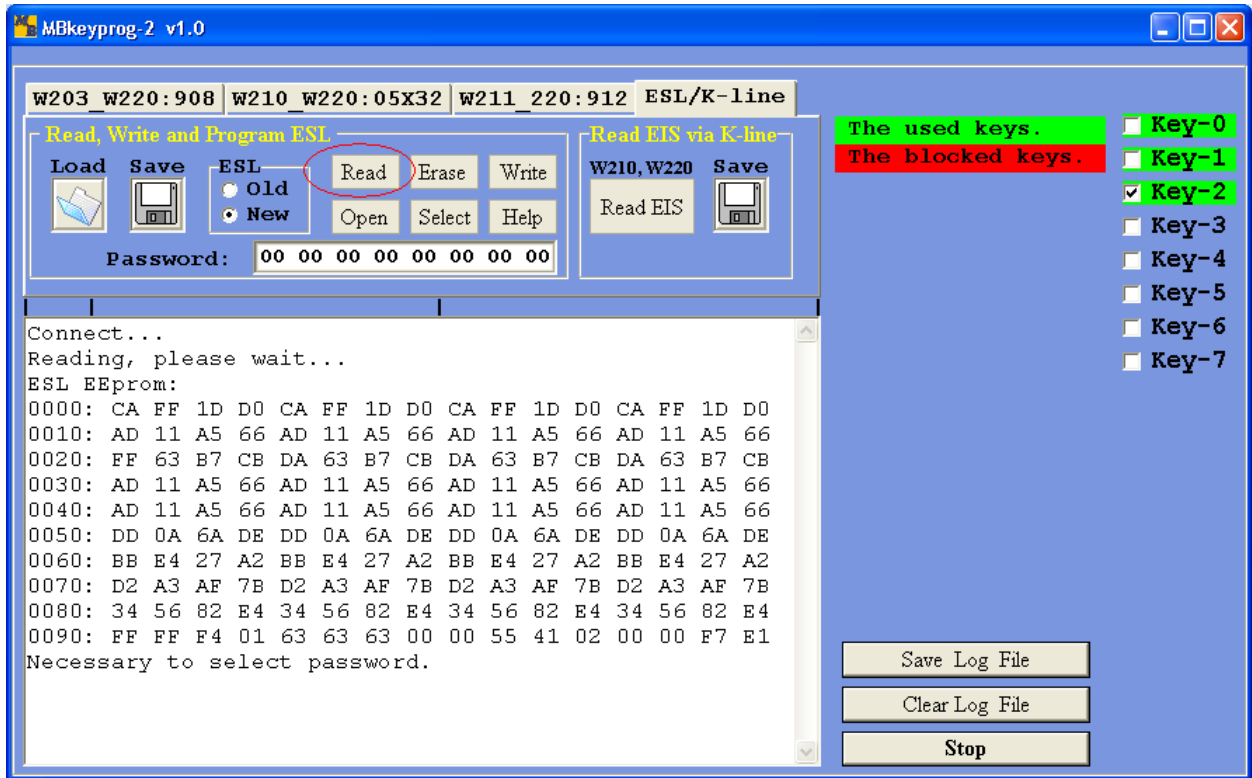
If you only need to unlock the steering column, then pre**ss Open**, in this case an automatic process of all eight keys hashes selection starts and the ESL opens.
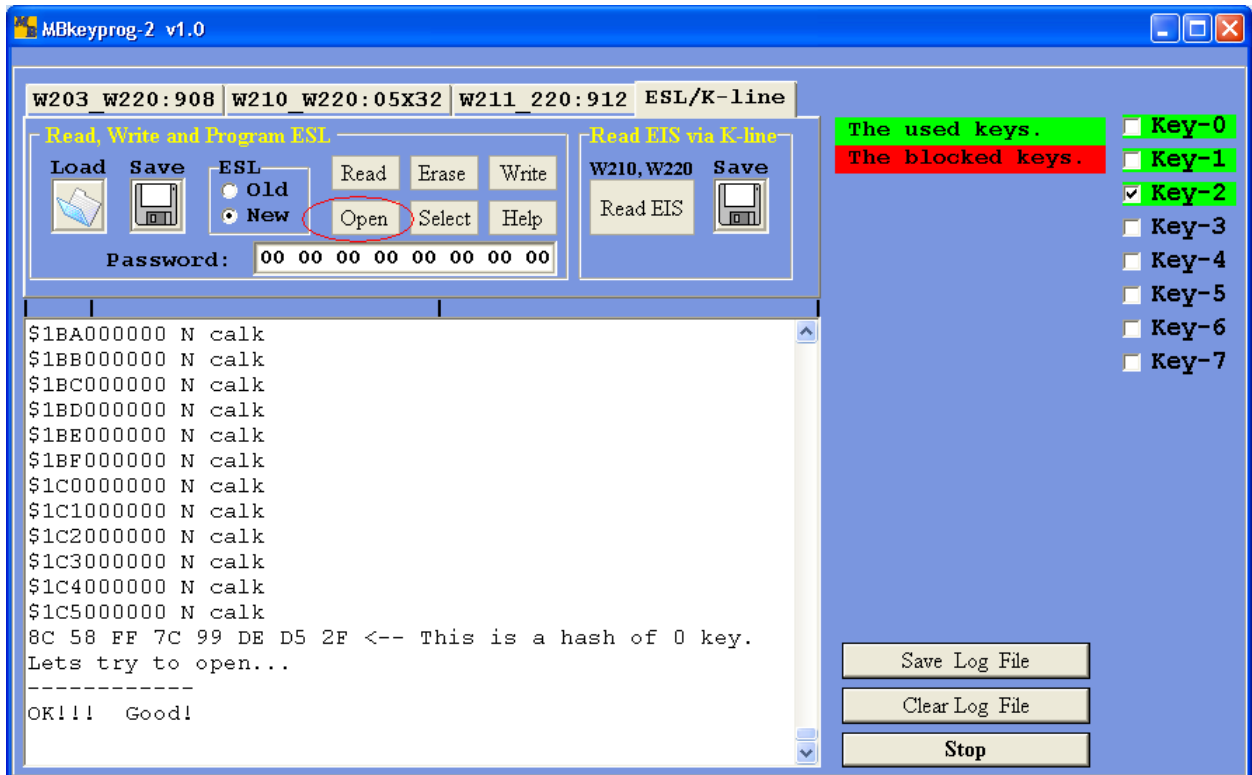
To write a new dump to the ESL, it is necessary to erase previously, which is not possible without the correct password selection

If you have not used the **Open** function before the operation of the password selection it is necessary to press **Read.** Then press **Select,** the password selection star**ts.**
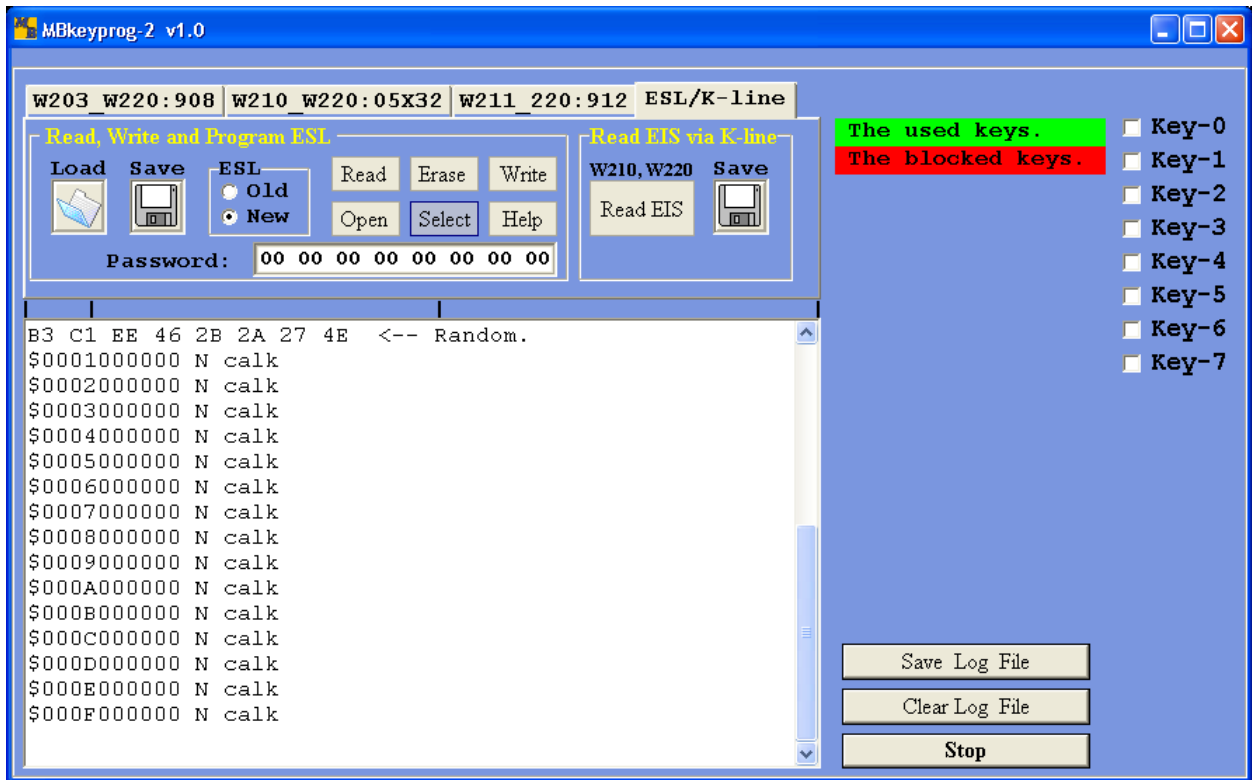
When the password is found you will see.
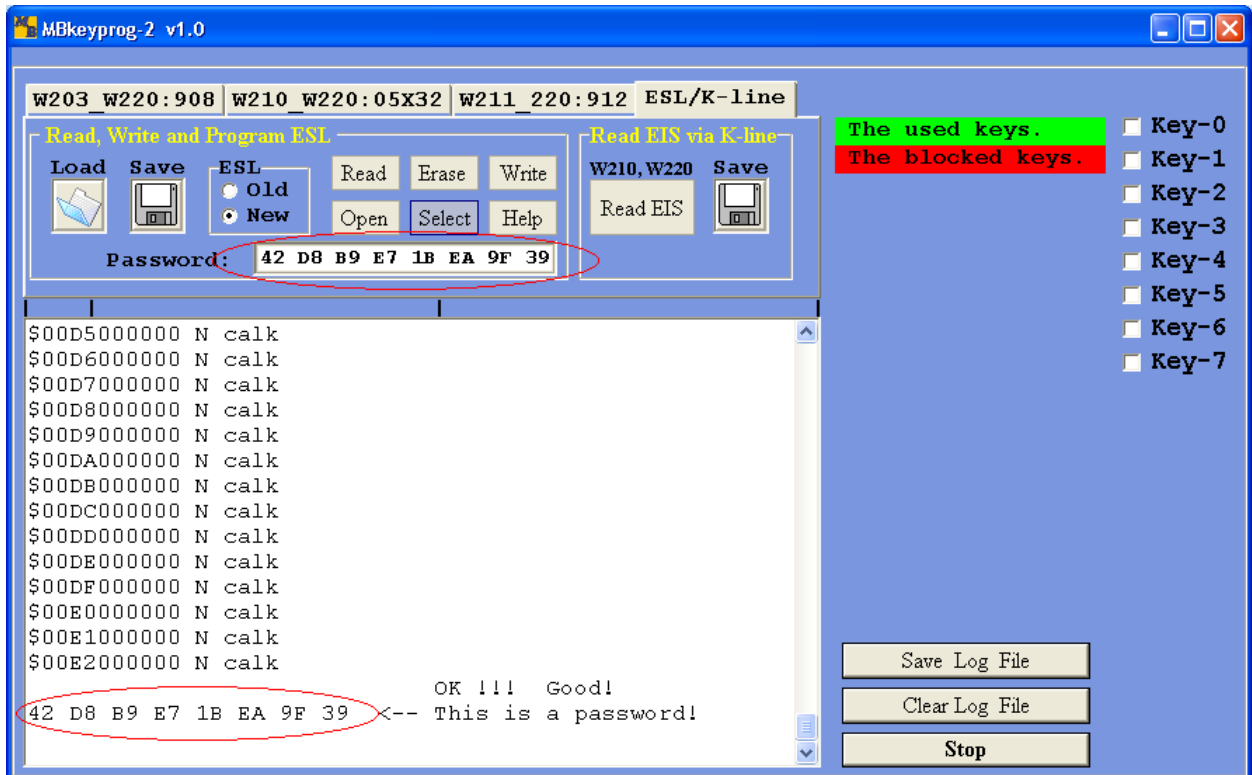
If you are not going to erase in this session, you should write the found password on paper, in order to save your time next time. In our example after successful finding of the password press **Erase** immediately and you get
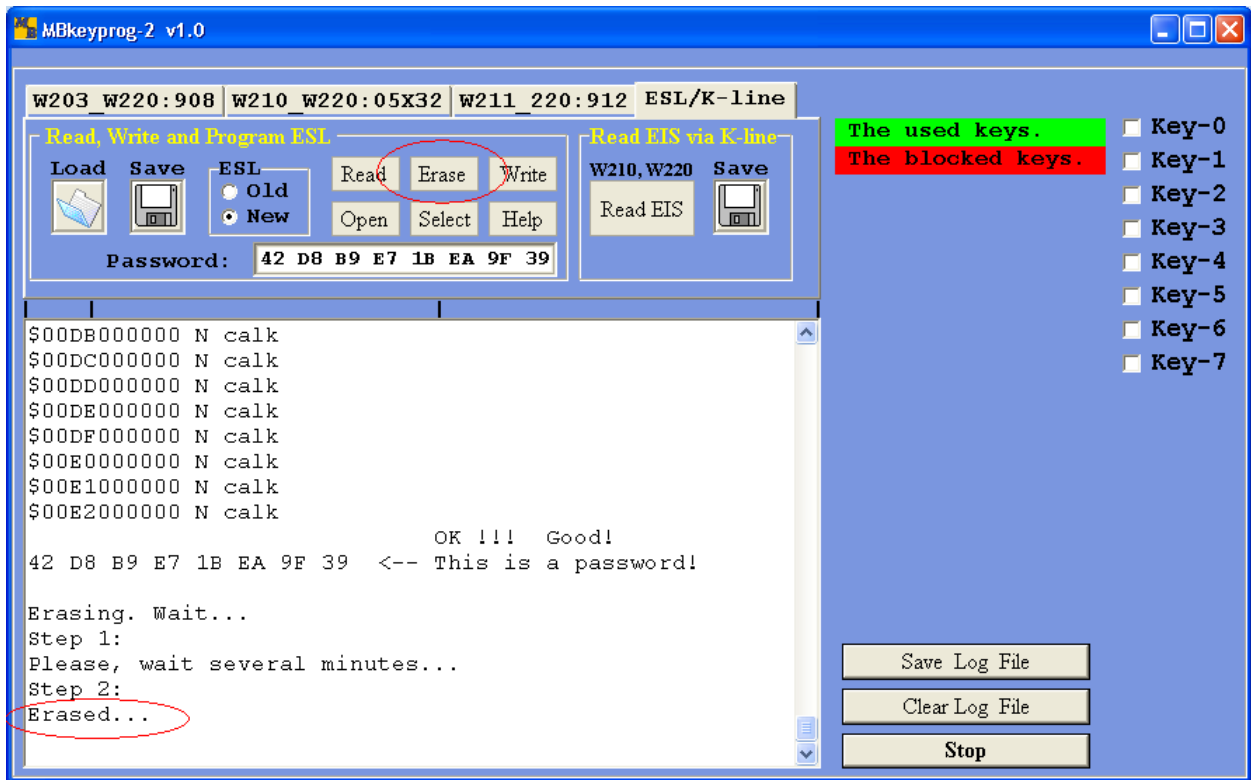
Now your ESL is ready for the new dump writing. In the same way you can prepare the used ESL for writing and put it away for "better times"

Load the previously generated **ESL_New.bin** file to the program
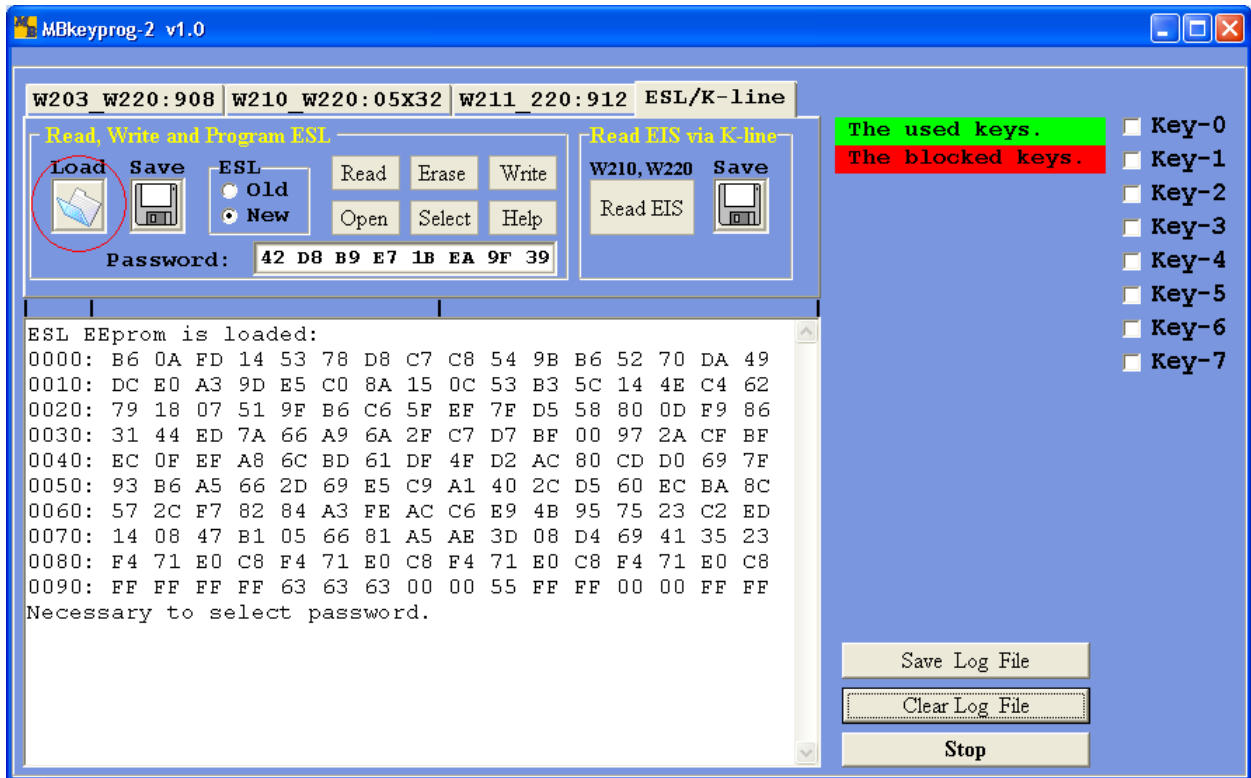
Press **Write**
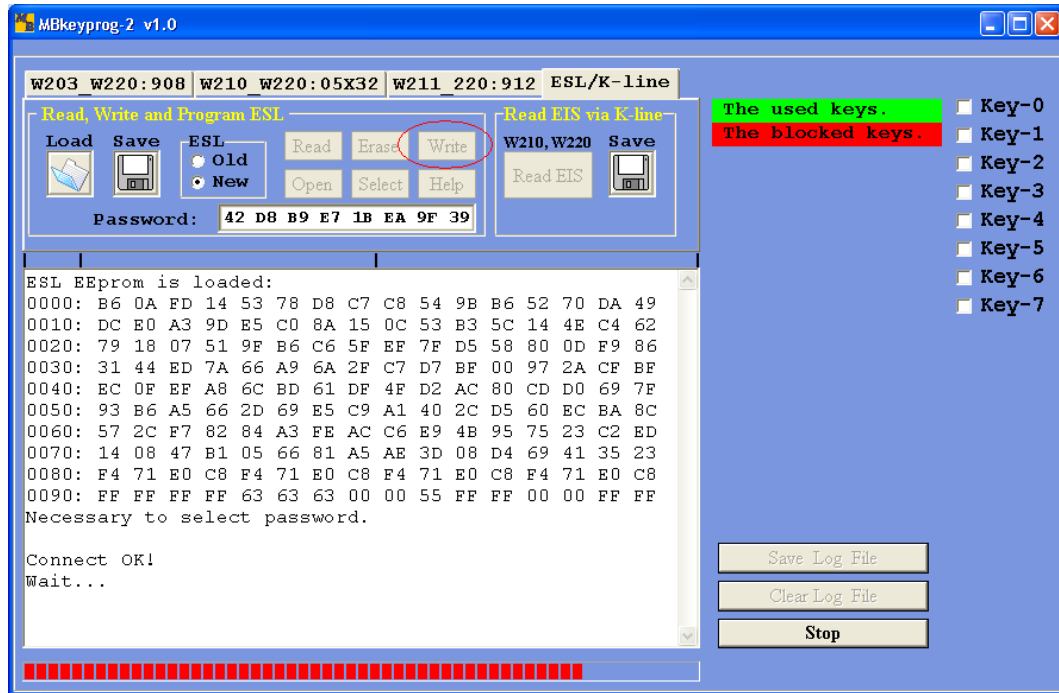
Upon completion you see
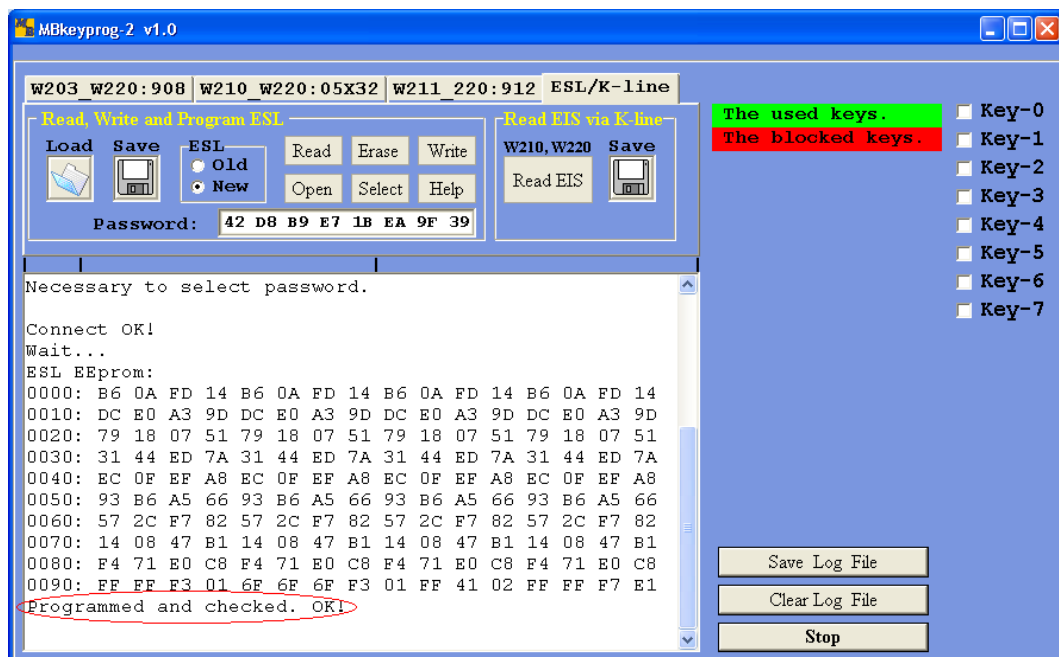
Disconnect the device and connect the ESL connector

Write the dump to the EIS processor which has been generated and automatically saved before. Write the right dump version to the key processor. Write the dump with the written key to the ECU.

You may need to insert the key in the EIS several times(up to 32!) till the key is accepted. Normally you succeed the first time.

Return the key to the client.

6. Supplementary options

6.1. Writing a new key to the ECU

Sometimes you need to write a previously prepared new key dump to the ECU. Press Load in the Key field and load **the previously prepared** key dump to the program.

Load the ECU dump

After successful loading you see

MBkeyprog-2 v1.0

W203_W220:908 | W210_W220:05X32 | W211_220:912 | ESL/K-line

W209,W211,W219,W220: MC9S12,MC68HC912

Load Save   CPU   ODO   ESL/ESM   Calculate
                ○ 912   ○ ESL   ESL/ESM
                ○ 9S12   New odo   ○ ESM   Help W211

The used keys.
The blocked keys.

☐ Key-0
☐ Key-1
☐ Key-2
☐ Key-3
☐ Key-4
☐ Key-5
☐ Key-6
☐ Key-7
☐ All

Load Save   KEY-2
              ○ - v.1
              ○ - v.2
              ○ - v.3

Load Save   ECU
              Help

```
Key N2 v_1 is loaded:
0000: 04 FC 00 C4 02 1B 51 F8 B7 28 54 01 3C 2B FA C9
0010: 66 41 3B 82 CE A4 EA 74 4D AC F7 FE 79 94 16 A2
0020: B1 41 61 9E C7 7D 2A 9F 3D 53 9C 9B D6 2D B1 26
0030: D3 06 B8 89 DC 84 3B 2E 8F EF 64 E3 17 A8 C6 14
0040: B2 2F 98 BD D7 0A E9 B2 90 9A 94 0A AF 0F AB 73
0050: 0B FF E3 09 6E 0B AC 2A 65 74 74 62 E8 23 97 78
0060: 09 14 54 6B D8 FC 59 55 14 79 6E E2 19 40 AB E2
0070: 9E DD 58 7A 93 49 C4 97 1B EA D2 2E 61 7B 0D FF
0080: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0090: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

EEprom ST95160 (EDC16_A646) is loaded.
```

WDB2110061A694784

A 646 153 87 79

Calculate ECU

Renew   ECU

Save Log File

Clear Log File

Stop

In the circled windows you see the VIN-code and the factory number of the ECU. If the correct dump has been chosen while loading you will see the right VIN-code at the least. If the VIN-code field is empty you have chosen the wrong version while loading the file. Press **Calculate ECU**, you see

MBkeyprog-2 v1.0

W203_W220:908 | W210_W220:05X32 | W211_220:912 | ESL/K-line

W209,W211,W219,W220: MC9S12,MC68HC912

Load Save   CPU   ODO   ESL/ESM   Calculate
                ○ 912   ○ ESL   ESL/ESM
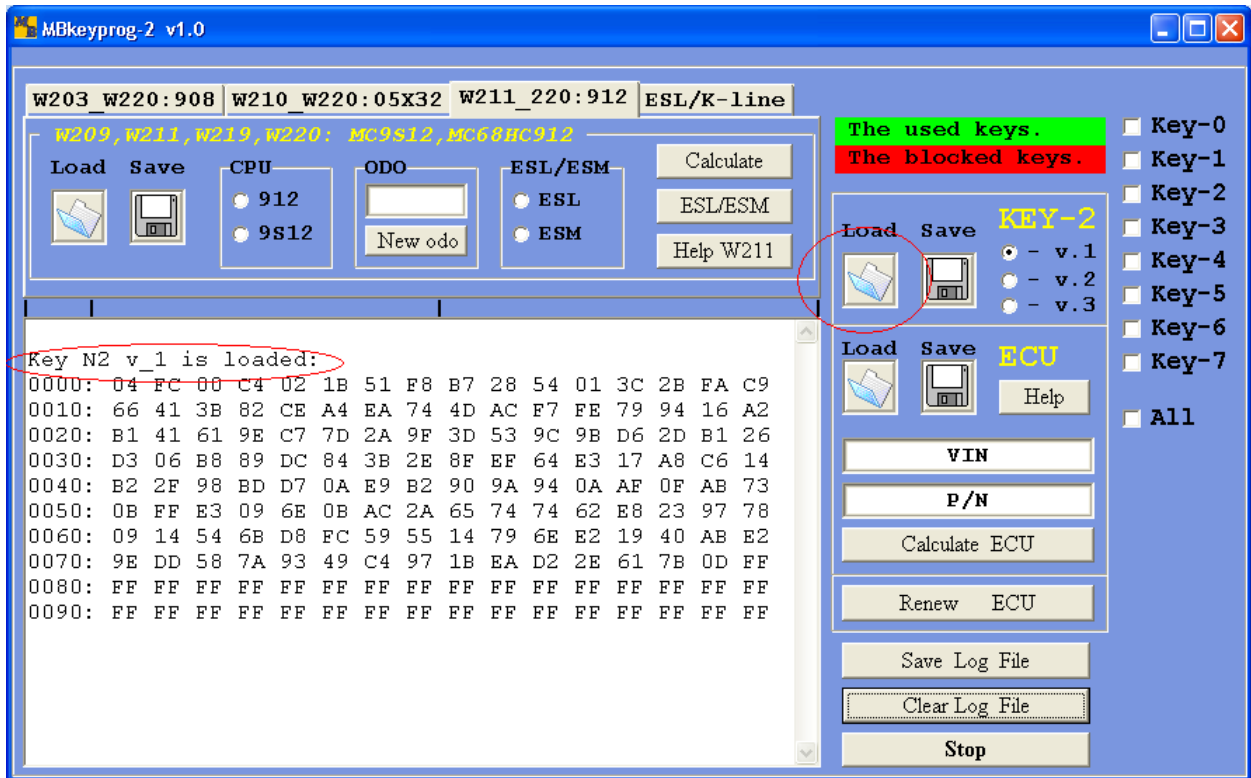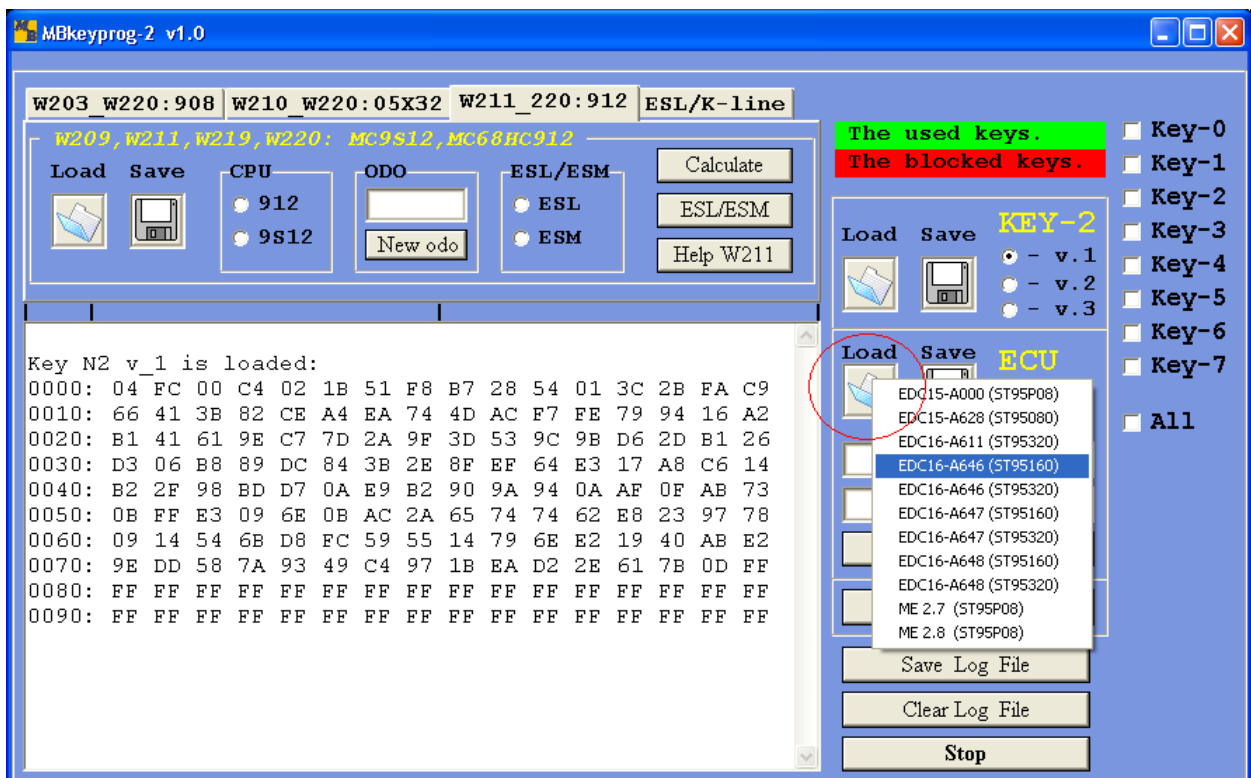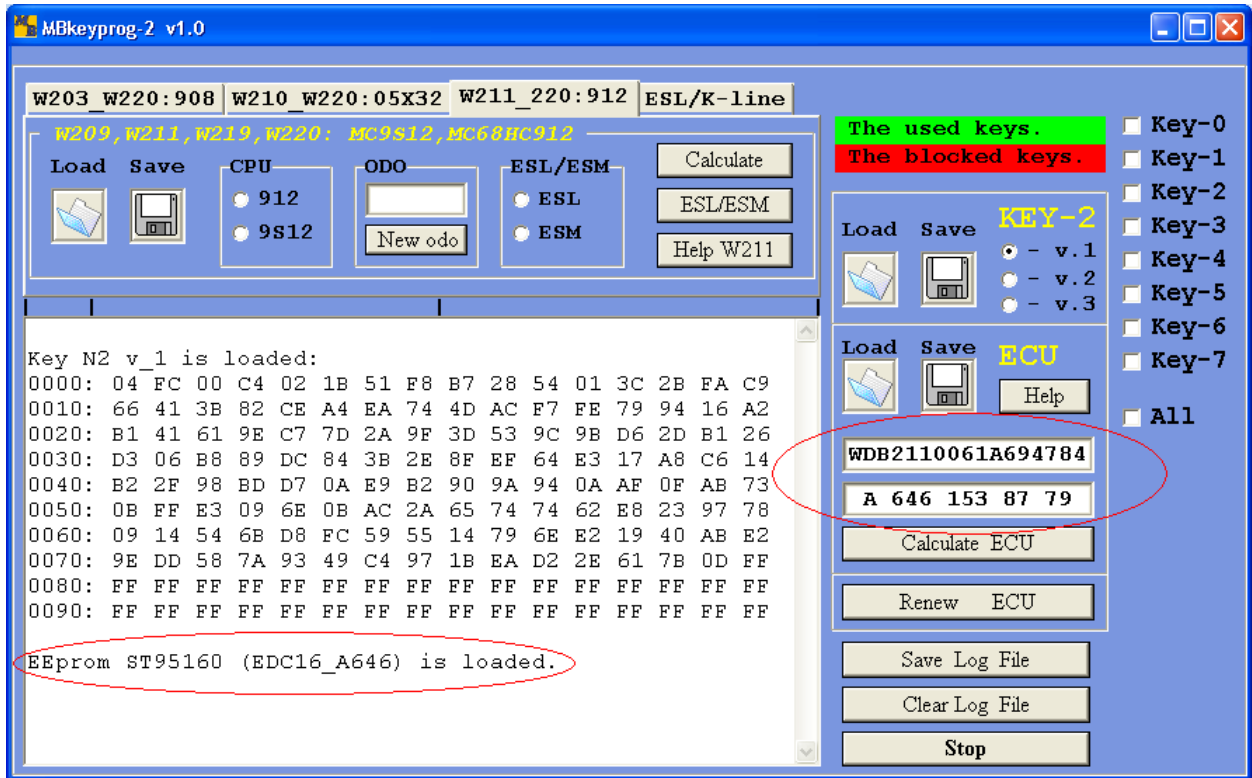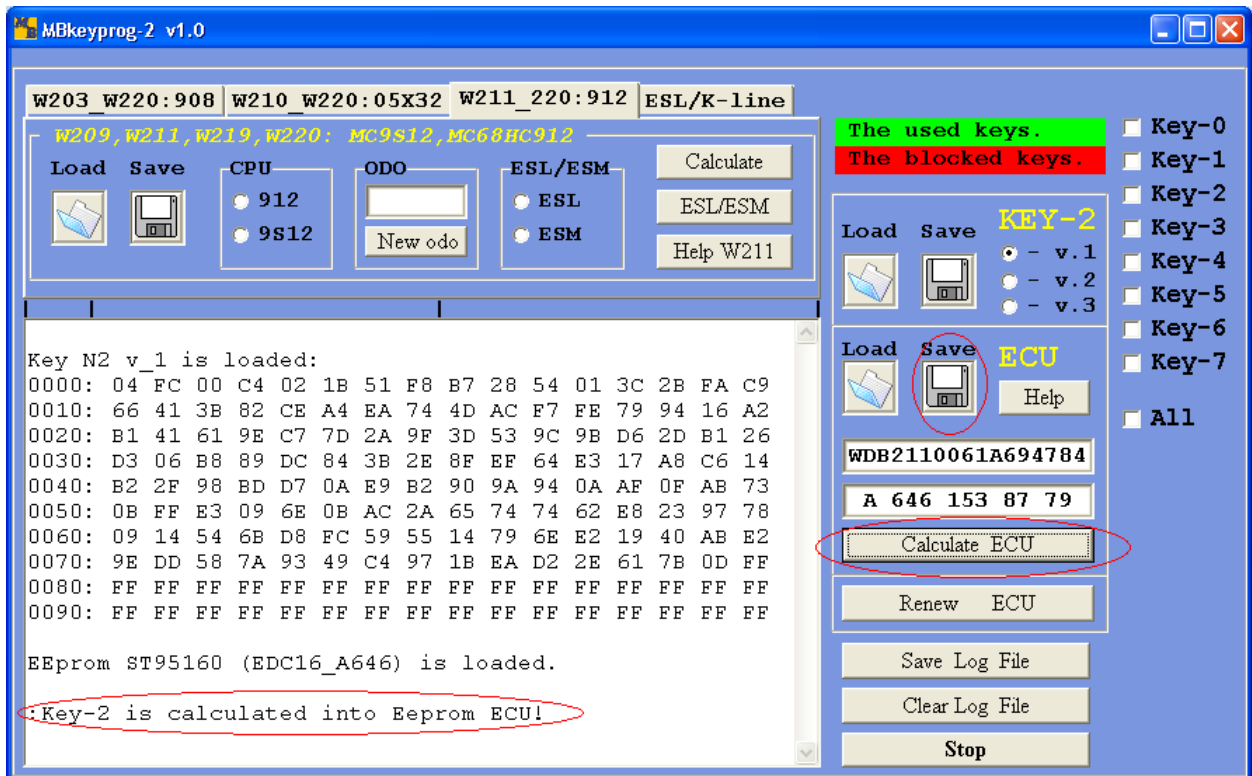   ○ 9S12   New odo   ○ ESM   Help W211

The used keys.
The blocked keys.

☐ Key-0
☐ Key-1
☐ Key-2
☐ Key-3
☐ Key-4
☐ Key-5
☐ Key-6
☐ Key-7
☐ All

Load Save   KEY-2
              ○ - v.1
              ○ - v.2
              ○ - v.3

Load Save   ECU
              Help

```
Key N2 v_1 is loaded:
0000: 04 FC 00 C4 02 1B 51 F8 B7 28 54 01 3C 2B FA C9
0010: 66 41 3B 82 CE A4 EA 74 4D AC F7 FE 79 94 16 A2
0020: B1 41 61 9E C7 7D 2A 9F 3D 53 9C 9B D6 2D B1 26
0030: D3 06 B8 89 DC 84 3B 2E 8F EF 64 E3 17 A8 C6 14
0040: B2 2F 98 BD D7 0A E9 B2 90 9A 94 0A AF 0F AB 73
0050: 0B FF E3 09 6E 0B AC 2A 65 74 74 62 E8 23 97 78
0060: 09 14 54 6B D8 FC 59 55 14 79 6E E2 19 40 AB E2
0070: 9E DD 58 7A 93 49 C4 97 1B EA D2 2E 61 7B 0D FF
0080: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0090: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

EEprom ST95160 (EDC16_A646) is loaded.

:Key-2 is calculated into Eeprom ECU!
```

WDB2110061A694784

A 646 153 87 79

Calculate ECU

Renew   ECU

Save Log File

Clear Log File

Stop

In this case the new ECU dump is not saved automatically to the hard disk. You should press **Save** of the **ECU** field, the file will be saved with the initial name and **_New** added
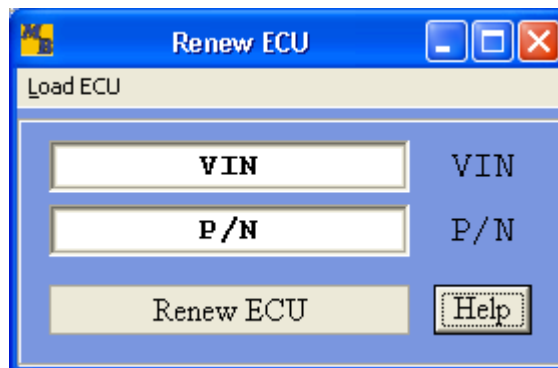
6.2. Renew ECU.

If you have a dealer device **Star Diagnosis,** you can generate a new ECU dump on the original ECU dump to use it later with the help of the dealer device. In this case you needn't write the new keys to the ECU. You can also use another used ECU instead of the faulty ECU.
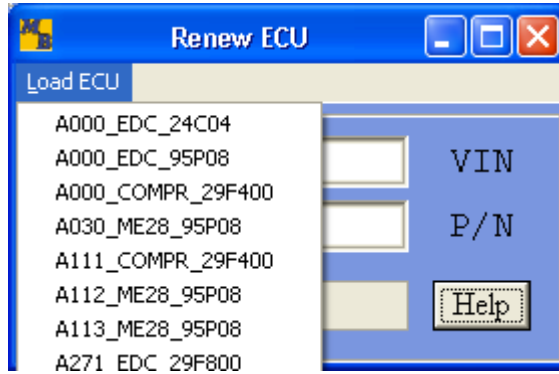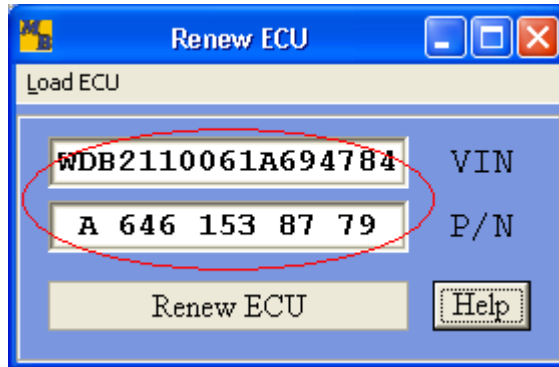
Press **Renew ECU**
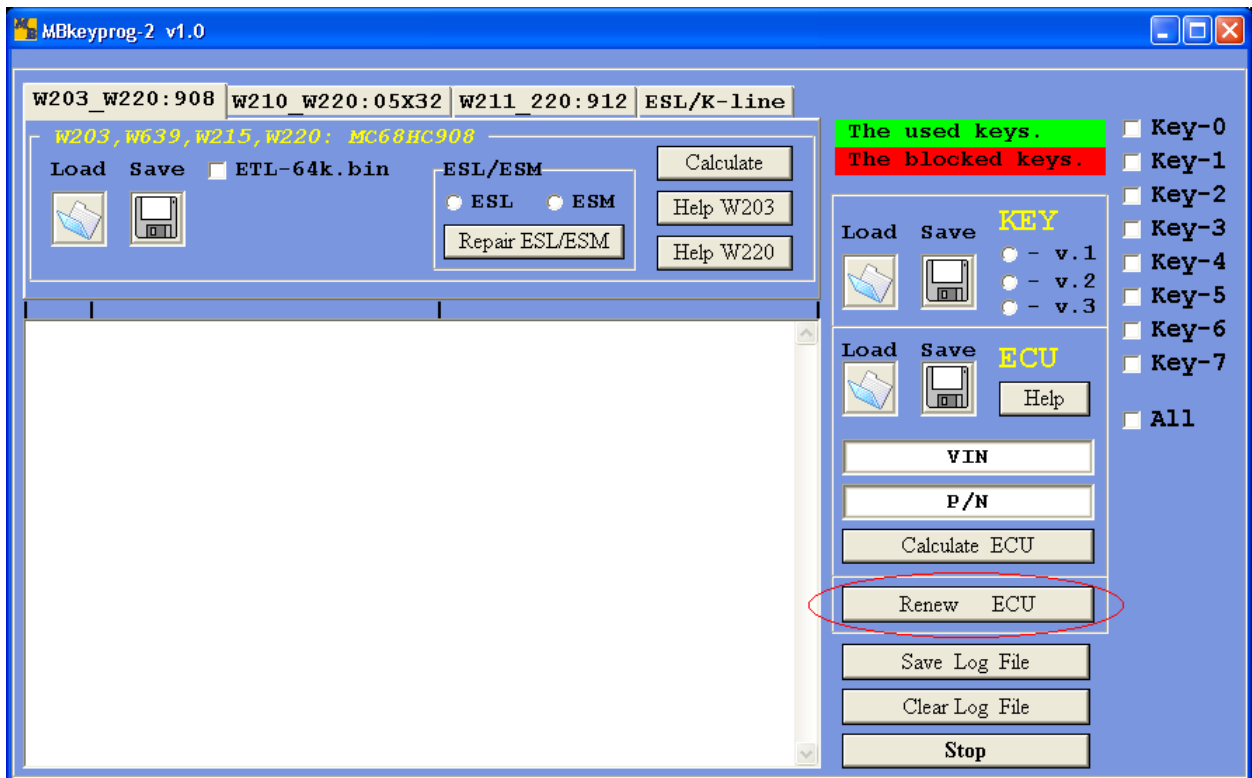
You see anew window

Load the previously read ECU dump

Upon completion you see

In the circled windows you see the VIN-code and the factory number of the ECU. If the correct dump has been chose while loading you will see the right VIN-code at the least. If the VIN-code field is empty you have chosen the wrong version while loading the file. Press **Renew ECU** (in the small window). And after that close the window.

You see in the main window.
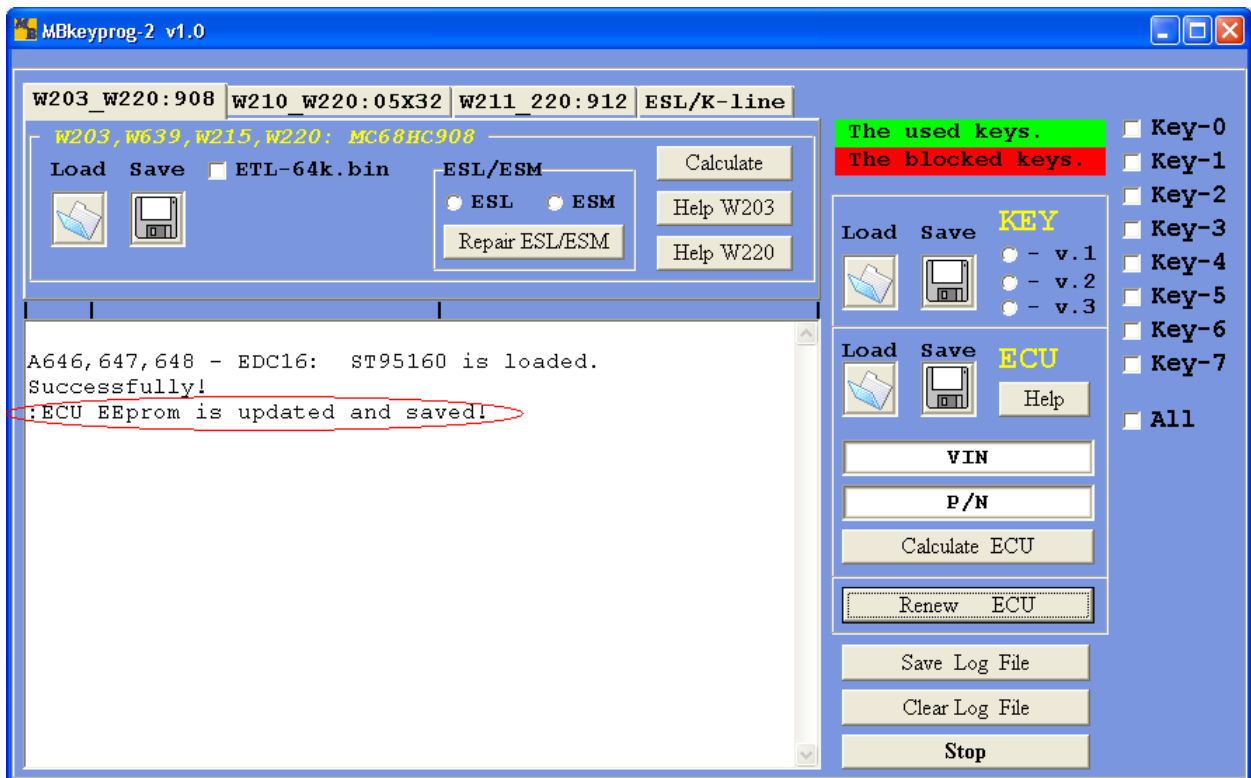
The new dump is automatically saved in the initial directory of loading. **_Renew** is added to the initial name

6.3. The conversion of the key dump format.

With the help of our program you can converse the key dump format (version) correctly. To do so load a random dump version
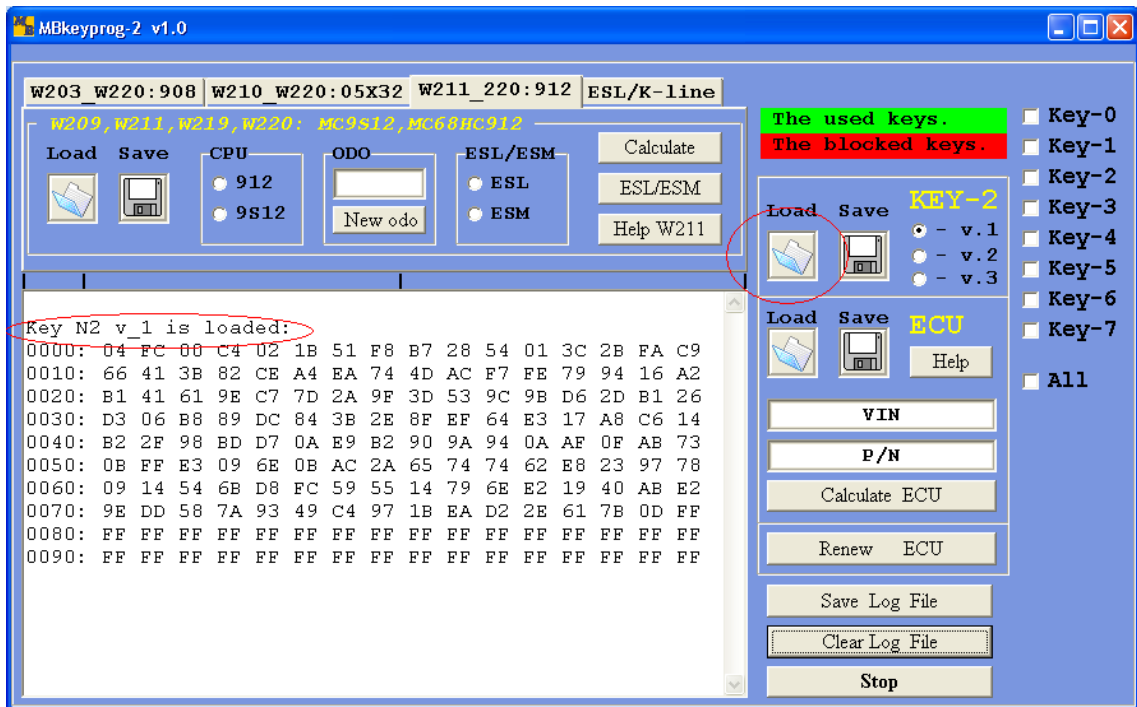
In the window you can see the loaded dump version. Choose version for conversion and you see
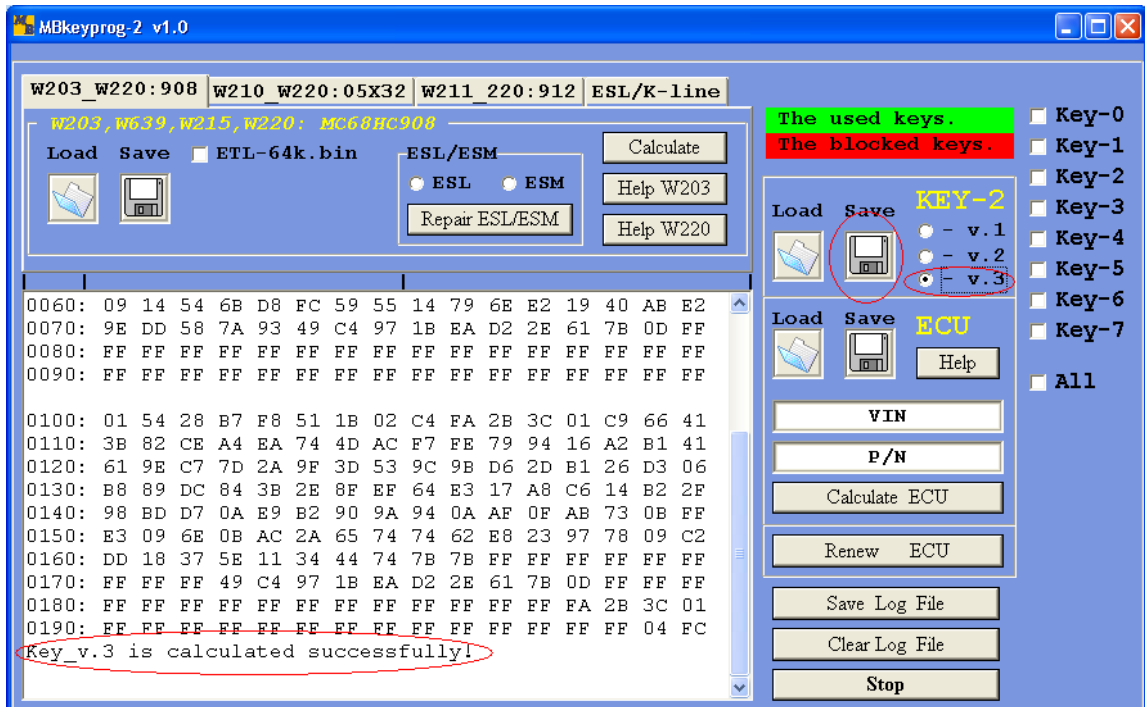
Then press **Save** and save the new dump to the hard disk

6.4. Key type identification:

Always write the third version of the dump to NEC processor!

If you work with old type keys with Motorola processor you may encounter three different dump versions

```
            Var 1: MA 567 880 011

000000 14 EC 00 66 11 BD 8D BE 63 F3 98 F5 62 67 B0 01 . .f.. c .bg..
000010 23 45 67 89 AB CD EF EE 25 6B E2 F6 08 80 60 4E #Eg    %k . `N
000020 D5 44 2C CF 53 BC 31 1E CB 95 2F 71 8F F9 7F BF  D, S 1. /q .•
000030 28 38 59 90 53 E7 A9 2E 55 34 27 14 2C 40 AF 23 (8Y S .U4'.,@ #
000040 14 2F DC A5 28 6A 64 E7 72 BD 89 0A 28 BC 6F 46 ./ (jd r. .( oF
000050 81 81 CD 40 58 0B 4B 9E 5B 50 04 66 A5 11 AD 7C  @X.K [P.f ..|
000060 92 0D 39 75 04 8F 9E F6 F6 7D 29 CF DC 4F F3 E7 .9u.   }) O
000070 FE 97 F7 7E A8 59 18 AB 8E 39 F2 43 16 7F 85 01 . ~ Y. 9 C.• .
000080 01 01 01 23 3F 12 71 FF FF FF FF A7 B4 07 76 AC ...#?.q.... .v
000090 0E 01 00 00 00 00 00 00 00 00 0E 7C FF 12 4C FF ...........|..L.
```

Var 2: MA 567 880 021, MA 567 880 041, 656 167 20 70

```
000000 01 98 F3 63 BE 8D BD 11 66 B0 67 62 F5 01 23 45 . c ..f.gb..#E
000010 67 89 AB CD EF EE 25 6B E2 F6 08 80 60 4E D5 44 g    %k . `N D
000020 2C CF 53 BC 31 1E CB 95 2F 71 8F F9 7F BF 28 38 , S 1. /q .• (8
000030 59 90 53 E7 A9 2E 55 34 27 14 2C 40 AF 23 14 2F Y S .U4'.,@ #./
000040 DC A5 28 6A 64 E7 72 BD 89 0A 28 BC 6F 46 81 81  (jd r. .( oF
000050 CD 40 58 0B 4B 9E 5B 50 04 66 A5 11 AD 7C 92 0D @X.K [P.f ..| .
000060 39 75 04 8F 9E F6 F6 7D 29 CF DC 4F F3 E7 FE 97 9u.   })  O  .
000070 F7 7E A8 59 18 AB 8E 39 F2 43 16 7F 85 7B 78 8D ~ Y. 9 C.• {x
000080 D2 83 73 B7 69 0A AA A9 71 12 3F 23 B0 67 62 F5  s.i. q.?#.gb.
000090 01 01 01 01 FF FF FF FF 7D 08 36 81 25 61 14 EC ........}.6 %a.
```

Var 3: MA 567 880 051, 654 367 2004

```
000000 01 98 F3 63 BE 8D BD 11 66 B0 67 62 F5 01 23 45 . c ..f.gb..#E
000010 67 89 AB CD EF EE 25 6B E2 F6 08 80 60 4E D5 44 g    %k . `N D
000020 2C CF 53 BC 31 1E CB 95 2F 71 8F F9 7F BF 28 38 , S 1. /q .• (8
000030 59 90 53 E7 A9 2E 55 34 27 14 2C 40 AF 23 14 2F Y S .U4'.,@ #./
000040 DC A5 28 6A 64 E7 72 BD 89 0A 28 BC 6F 46 81 81  (jd r. .( oF
000050 CD 40 58 0B 4B 9E 5B 50 04 66 A5 11 AD 7C 92 F2 @X.K [P.f ..|
000060 EE 7E 2B A9 58 BB EE 78 95 7F FF FF FF FF FF FF ~+ X  x •......
000070 FF FF A8 59 18 AB 8E 39 F2 43 16 7F 85 7C FF FF .. Y. 9 C.• |..
000080 FF FF FF FF FF FF FF FF 71 12 3F 23 B0 67 62 F5 ........q.?#.gb.
000090 00 00 00 00 FF FF FF FF FF FF FF FF FF FF 14 EC ............
```

Attention! If you load, for example, the third version of the dump to the key with the first processor version the key will not work!