A·B·R·I·T·E·S
automotive solutions

ABRITES ABPROG PROGRAMMER CLASSIC

User manual
version 2.5

Important notes

The Abrites software and hardware products are developed, designed and manufactured by Abrites Ltd. During the production process we comply to all safety and quality regulations and standards, aiming at highest production quality. The Abrites hardware and software products are designed to build a coherent ecosystem, which effectively solves a wide range of vehicle-related tasks, such as:

Diagnostic scanning;
Key programming;
Module replacement,
ECU programming;
Configuration and coding.

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There are certain conditions, upon which the warranty cannot be applied. The warranty shall not apply to damages and defects caused by natural disaster, misuse, improper use, unusual use, negligence, failure to observe the instructions for use issued by Abrites, modifications of the device, repair works performed by unauthorized persons. For example, when the damage of the hardware has occurred due to incompatible electricity supply, mechanical or water damage, as well as fire, flood or thunder storm, the warranty does not apply.

Each warranty claim is inspected individually by our team and the decision is based upon thorough case consideration.

Read the full hardware warranty terms on our website

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Some important points:
Block all wheels of the vehicle when testing. Be cautious when working around electricity.
Do not ignore the risk of shock from vehicle and building-level voltages.
Do not smoke, or allow sparks/flame near any part of the vehicle fuel system or batteries.
Always work in an adequately ventilated area, vehicle exhaust fumes should be directed towards the exit of the shop.
Do not use this product where fuel, fuel vapours, or other combustibles could ignite.

In case any technical difficulties occur, please contact the
Abrites Support Team by email at support@abrites.com

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List of revisions

Date	Chapter	Description	Revision
01.10.2015	ALL	Document revised	2.0
13.01.207	ALL	Document revised	2.1
01.12.2017	ALL	Added keys for renew	2.2
14.06.2018	ALL	Added EWS reading	2.3
14.08.2018	1	Added ZN057 adapter	2.3
07.11.2019	ALL	PSA key renewal added	2.4
18.07.2023	ALL	General Revision and adding missing information	2.5

1. Introduction

The ZN030 ABPROG Programmer is a set of devices, designed to assist with many procedures, which require work on bench with multiple units in the vehicle.

Main functionalities:

- Read, write and erase SPI, Microwire and I2C memories
- Read, write and erase memory of the FEM/BDC without removing it
- Read and write Bosch EDC16 units (MPC)
- Reading, writing, and erasing of NEC MCUs from Mercedes-Benz IR-keys
- Renew HITAG 2 type keys
- Reading and writing NEC V850 in different modules
- Reading EWS masks

ABProg should be used with ABRITES software produced by Abrites Ltd.

ABRITES is a trade mark of Abrites Ltd.

2. Getting Started

2.1 Scope of the manual

This document describes software and hardware installation of kit for EEPROM and MCU memory programming. ABProg software has a classic and upgraded versions - many of the new and upcoming functionalities should be found in the ABProg upgraded software

2.2 System Requirements

Minimum system requirements – Windows 7, SP1 with 512 MB RAM
USB port with supply 100 mA / 5V +/- 5%

2.3 Supported devices

SPI EEPROM
ST M35080VP / ST M35080V6
ST D080D0WQ
ST D160D0WQ
ST M95010
ST M95020
ST M95040
ST M95080
ST M95160
ST M95320
ST M95640
ST M95128
ST M95256
ST M95P08

I2C EEPROM
24C01
24C02
24C08
24C16
24C32
24C64
24C128
24C256
24C512
24C1024

MW EEPROM
93C46 8bit / 16bit
93C56 8bit / 16 bit
93C66 8bit / 16 bit
93C76 8bit / 16 bit
93C86 8bit / 16 bit

PCF

AUDI 8T0959754XX, 4G0959754XX, 4H0959754XX 315 / 868 / 433 MHz
BMW F HUF5XXX, 5WK496XX 868 / 315 / 433 MHz
BMW E 5WK49XXX Remote / Keyless 868 / 315 / 433 MHz
PORSCHE 7PP969753XX 433 / 434 / 315 MHz
VOLVO 5WK4926X 433 / 900 MHz
RENAULT AES, AES KEYLESS, DACIA AES, FLUENCE, MEGANE 3
OPEL ASTRA H, ZAFIRA B, ASTRA J/INSIGNIA
RANGE ROVER 5E0U40247 434MHz
MITSUBISHI G8D 644M
PSA 21676652, E33CI002, E33CI009, E33CI01B
CHRYSLER JEEP DODGE KOBOTO04A
BUICK 13500224(13584825),13500225(13584825) 315MHz
CHEVROLET 135XXXXX
GM KEYLESS 433MHz 5BTN
CADILLAC NBG009768T 315MHZ 5BTN KEYLESS

MB NEC KEY

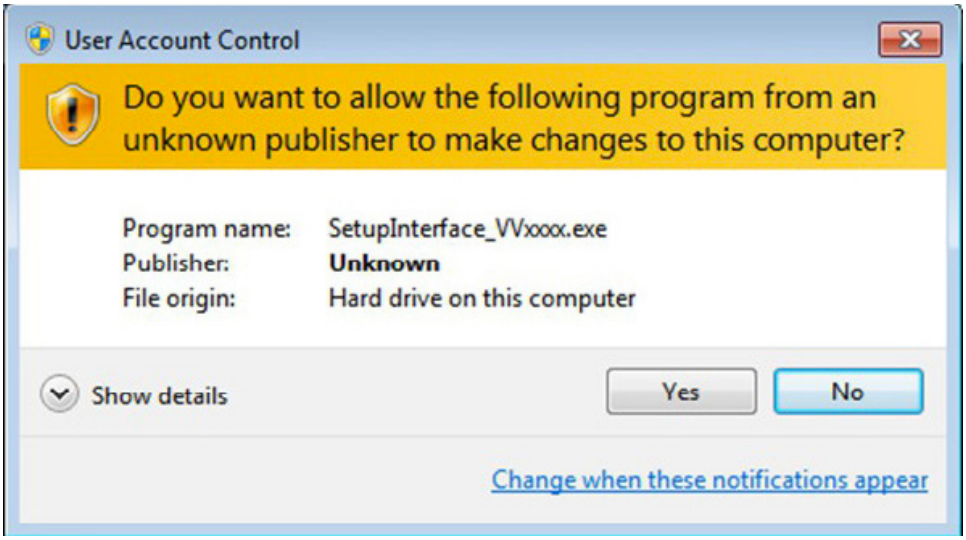
EWS

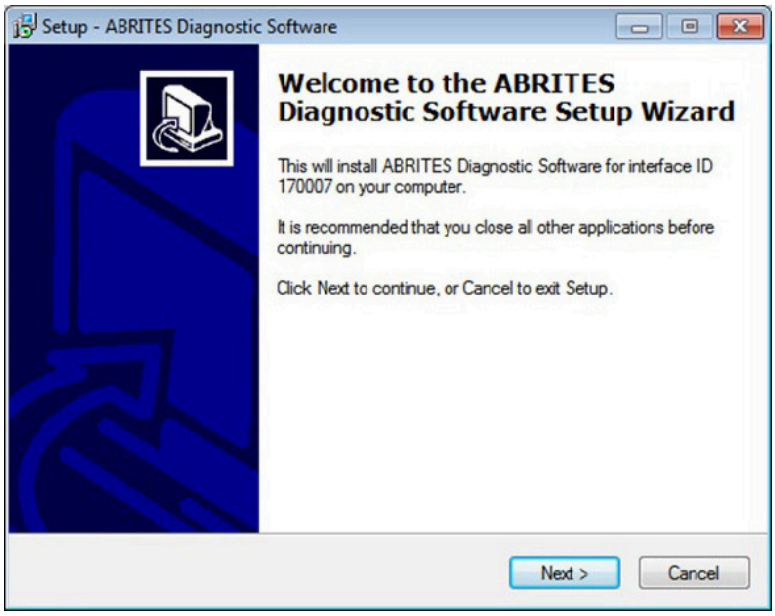
0D46J
2D47J

2.4 Software installation steps

Please start the executable file above to initiate installation procedure and follow the on screen instructions.

Depending of your operation system and settings you can be asked to confirm starting of installation procedure.

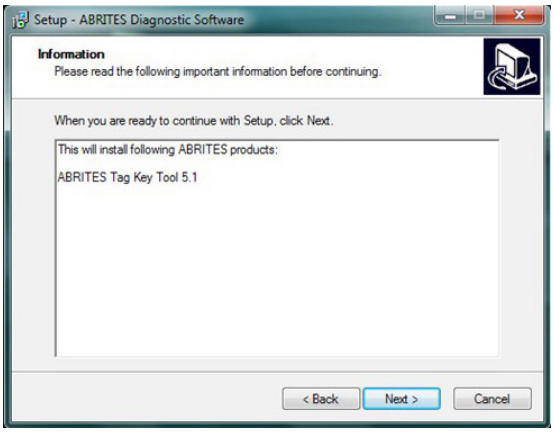




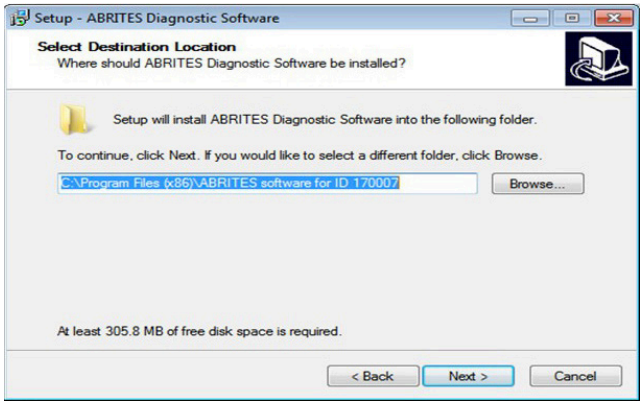
Press “Next” button to proceed with the installation.

Read carefully license agreement and select “I accept the agreement” if you accepting all. Then press “Next” button.
If you not agree press cancel to interrupt installation procedure.

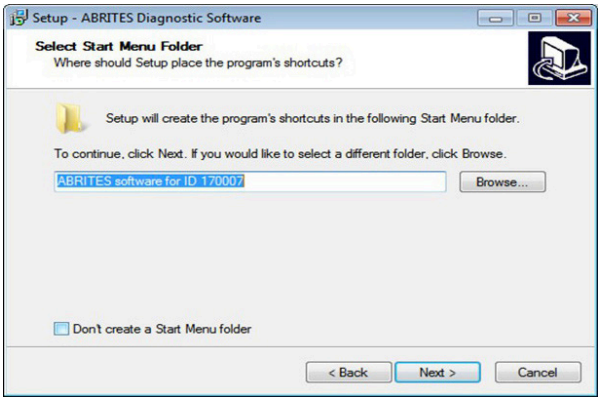
Press “Next” button to proceed with the installation.



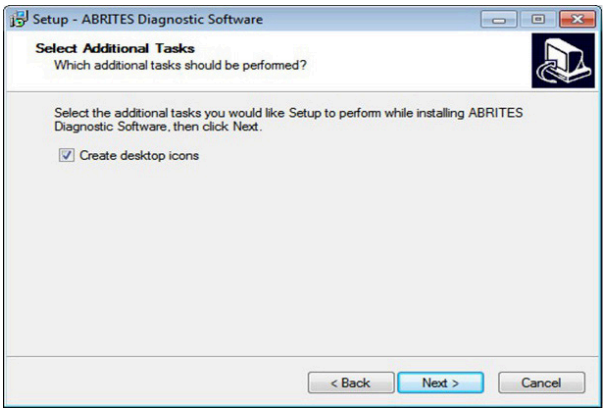
Press “Next” button to proceed with the installation.



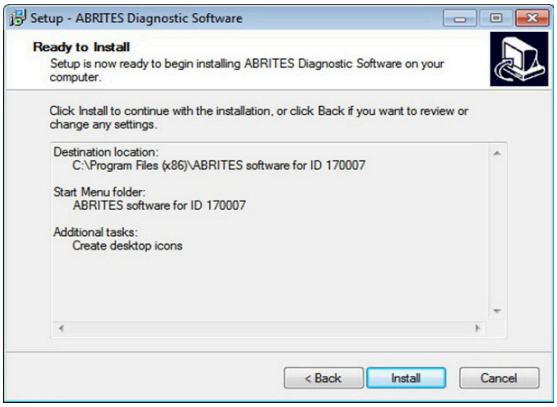
Press “Next” button to proceed.



If you don’t want desktop icons unchecked the check box about creation of icons.
Press “Next” button to proceed.



Press “Install” and wait until installation complete.

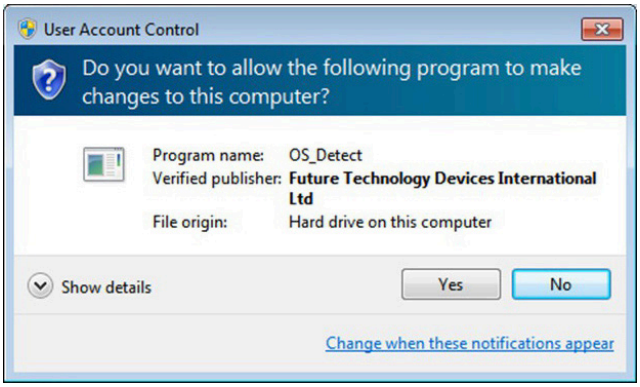


Be sure that check box about installation of interface's USB drivers is set especially if you installing for first time Abrites Diagnostic Software.

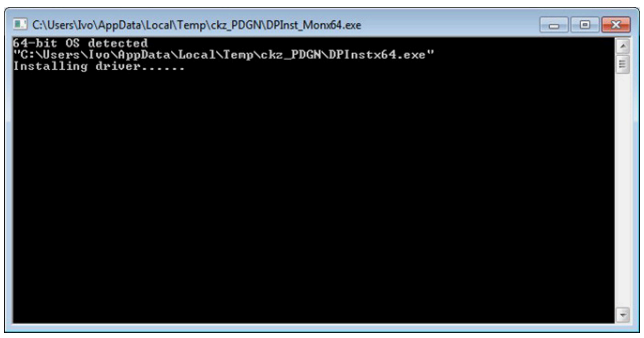
Press "Finish".

Depending setting of your operation system you can be asked to confirm installation of USB drivers.

Press "Yes".



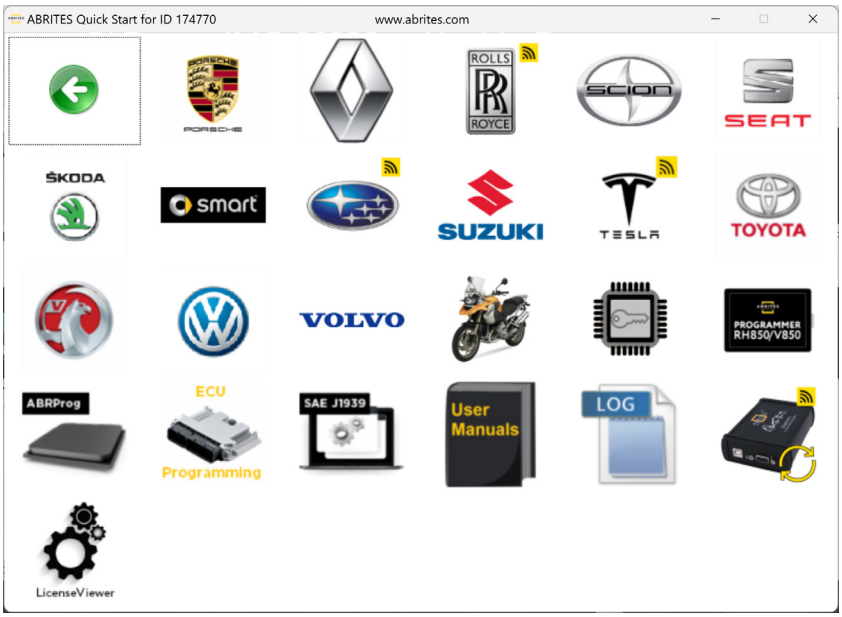
Wait until installation of USB driver finish.



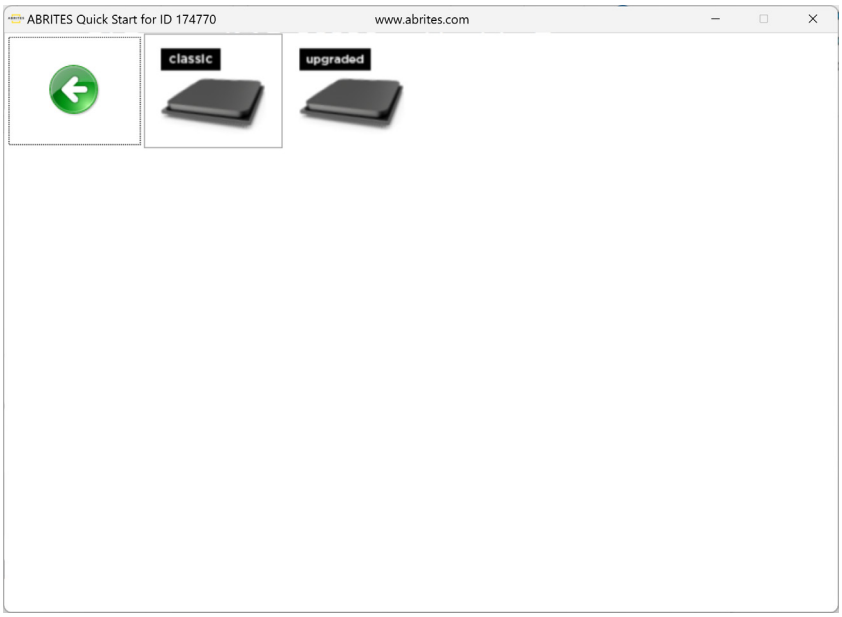
2.5 Connection of the programmer to the interface

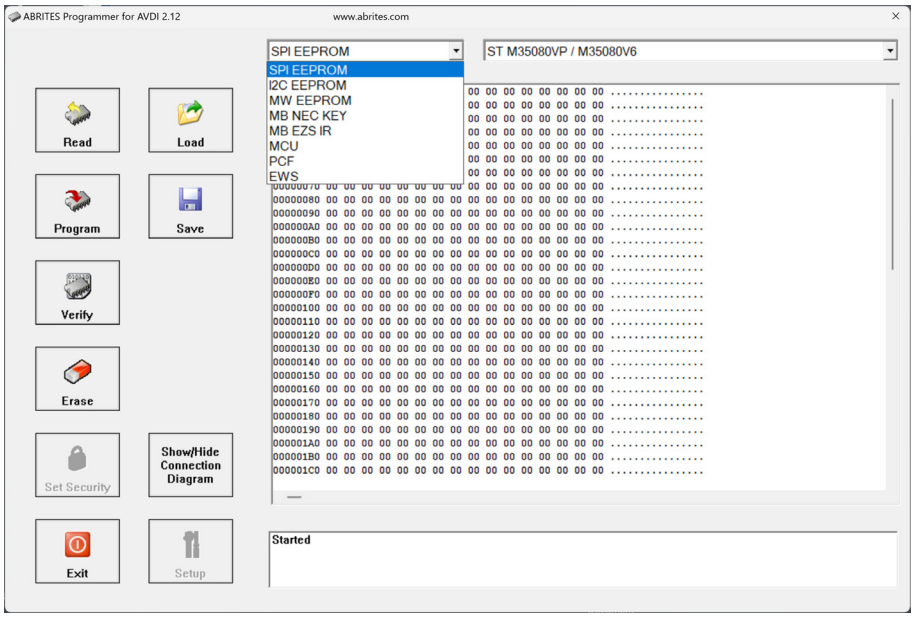
2.6 Starting of the software

When programmer is ready and connected to the interface you can start the software.



When the programmer (ZN045) is connected to the AVDI you can start the software by selecting ABProg > Classic:





3. Hardware

3.1 ZN030 - ABPROG set

The ZN030 ABProg set contains the following:

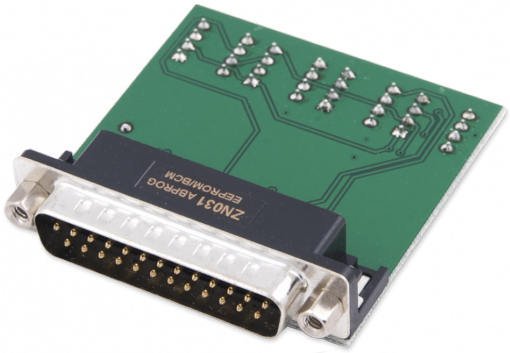
- CB101 extension cable
- ZN031 Abprog eeprom BCM - for reading, writing and erasing of SPI, Microwire and I2C memories.
- ZN033 NEC MCU adapter - for reading, writing and erasing of NEC MCUs from Mercedes-Benz IR-keys.
- ZN035 Abprog eeprom socket - solution used when reading and writing 8-pin eeprom memories.
- ZN045 Abprog programmer
- DB25 Male connector

There are additional tools that are used with the ABProg programmer, which are sold separately and are described in this user manual.

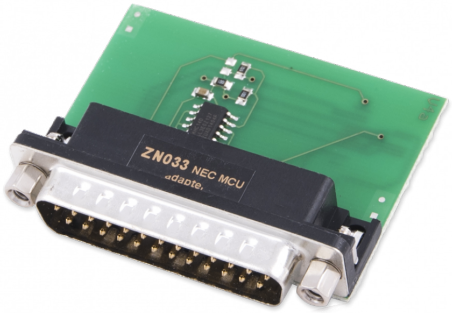
ZN030 set includes:

ZN045 Abprog programmer

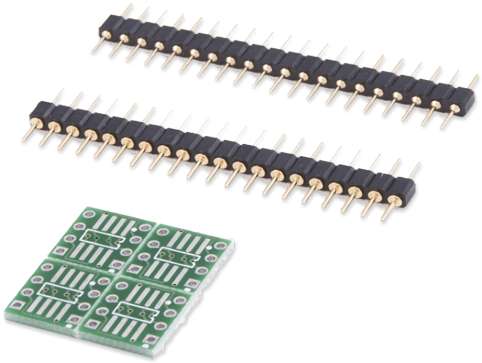
ZN031 - ABPROG EEPROM/BCM adapter



ZN033 – ABPROG NEC adapter



ZN035 - ABPROG eeprom socket

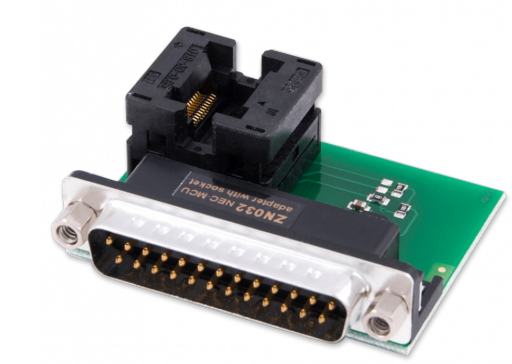


CB101 extension cable

DB25 Male Connector

3.2 Additional cables and adapters for ABProg programmer

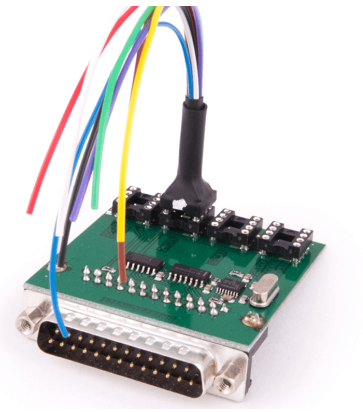
ZN032 – ABPROG NEC adapter with socket



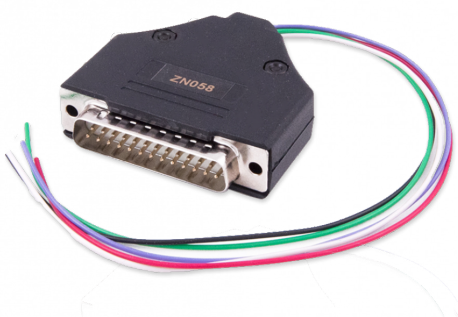
ZN046 - Key Renewal Adapter

ZN055 - ABPROG EWS3 adapter

ZN057 - EEPROM wire extender for ABPROG EEPROM/BCM adapter

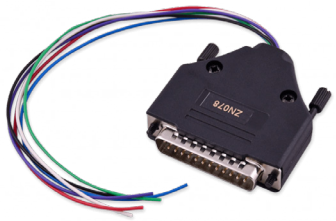


ZN058 - V850E2 adapter for ABPROG



ZN073 - BDM Programmer
ABProg Upgraded software

ZN078 - V850ES ADAPTER for ABPROG
ABProg Upgraded software



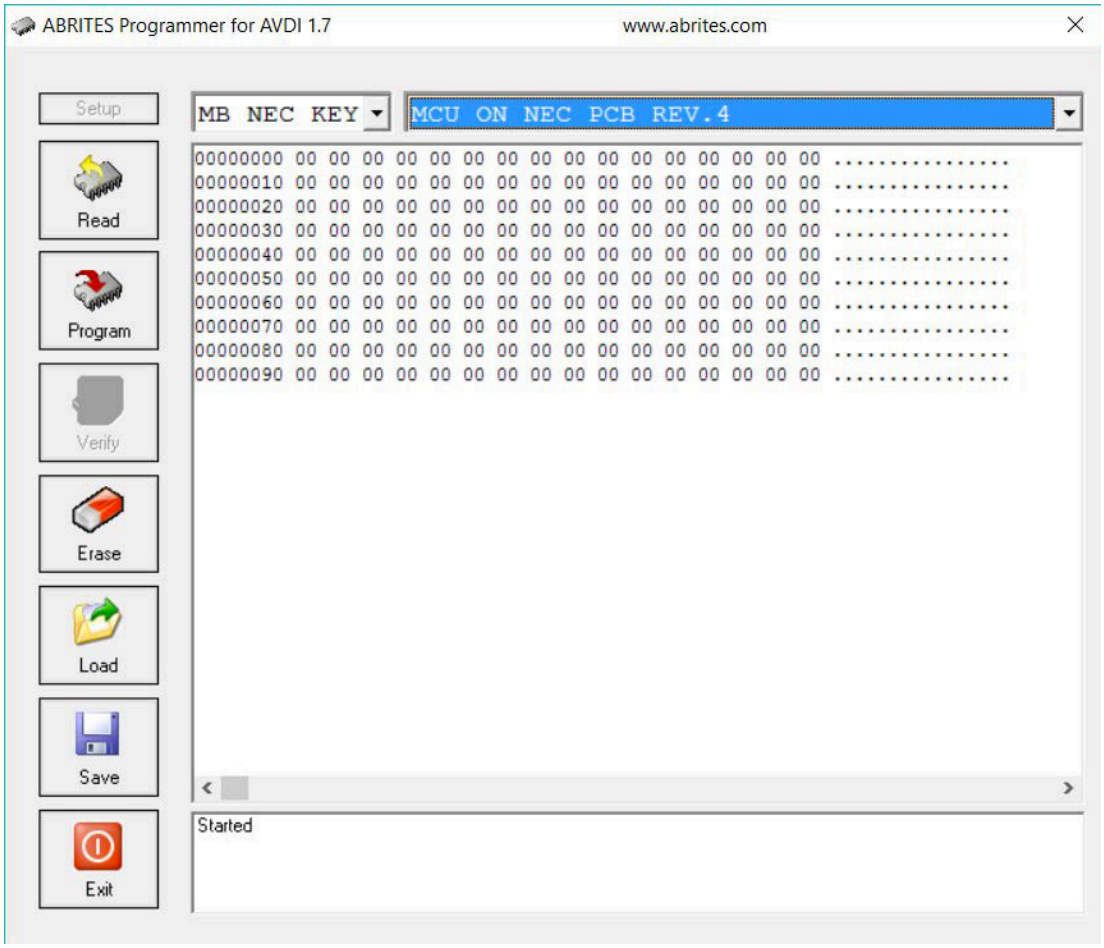
ZN086 MC9S12 ADAPTER for ABPROG
ABProg Upgraded software

4. ZN032 – ABPROG NEC adapter with socket

The ZN032 adapter is used for reading, writing and erasing of NEC MCUs from Mercedes-Benz IR-keys without soldering the memory to the adapter.

The ZN032 Adapter is used just like the ZN033 Adapter, but there is no need to solder the NEC MCU from the key PCB to the ZN032. You can very easily place the NEC inside the socket and close it. Again, the ZN032 Adapter can be connected to ZN045 that goes into the AVDI DB-25 port.

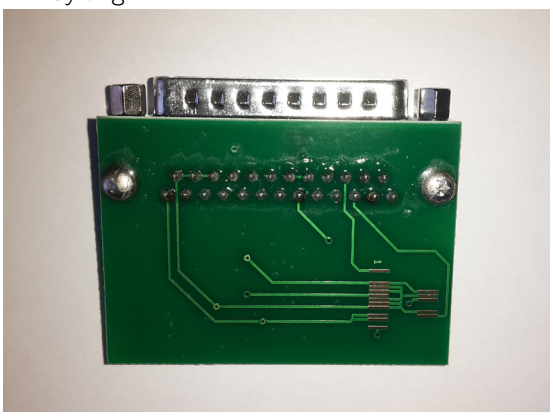
For opening the software and proceeding with the procedure, simply open the ABPROG Programmer For AVDI Software and choose “MB
NEC KEY” and the revision of the ABPROG’s PCB as shown in the picture below.

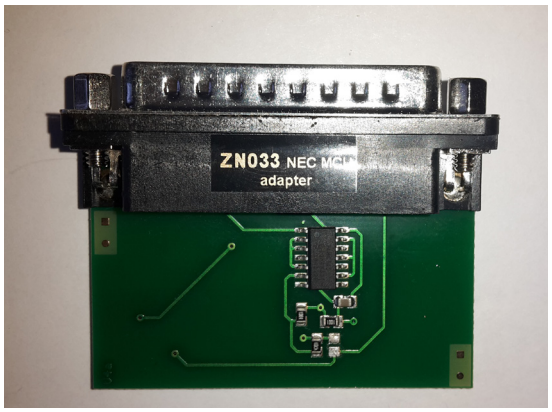


After choosing the desired option, you can proceed with reading, programming, erase and verify upon erasing the information if it is still present.

5. ZN033 – ABPROG NEC adapter

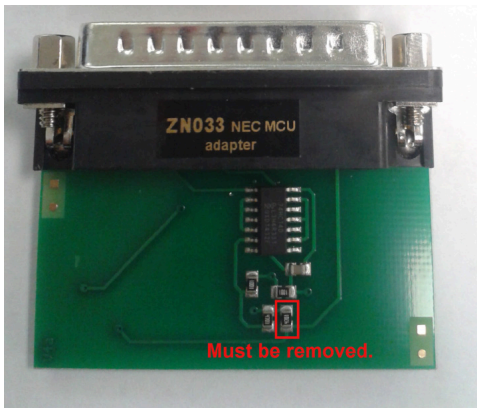
The ZN033 adapter is used for reading, writing and erasing of NEC MCUs from Mercedes-Benz IR-keys by soldering the memory to the adapter, for example in cases when the customer needs to make a NEC IR key virgin.

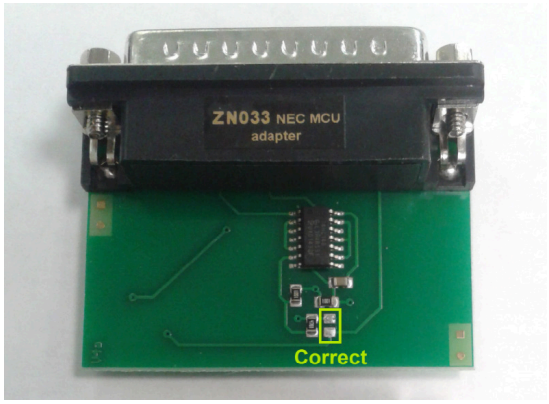




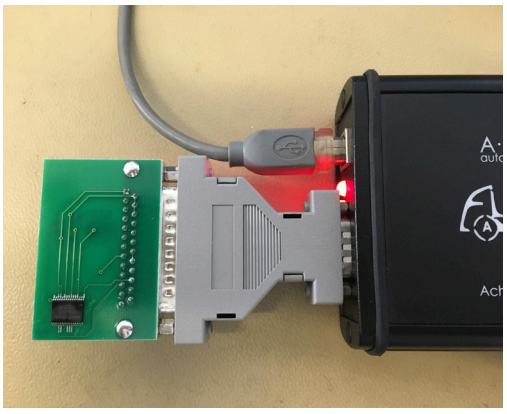
Using the ZN033 NEC MCU Adapter, you will be able to solder NEC processors used in Mercedes keys, read them and make them virgin. The supported versions are V57 and some V51.

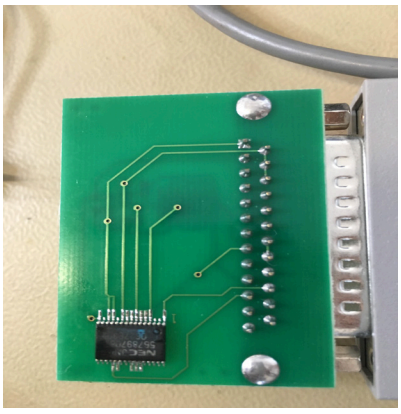
If you already have an ZN033 NEC MCU Adapter, you might have to unsolder the resistor as shown in the below pictures.





Once the NEC MCU is soldered to the ZN033 Nec MCU Adapter, the ZN033 has to be connected to ZN045 ABPROG. The ABPROG can be directly connected to AVDI as shown in the picture below:





6. ZN046 Key PCB Renewal Adapter

The ZN046 is an adapter for renewing used keys in order for them to be programmed to another vehicle. It is an invaluable tool for all locksmiths, used with the ABPROG programmer.

Supported keys:
All types of keys with a PCF processor
(full supported list in the Compatibility tab, pinout available in the Technical specifications tab)

During the key renewal procedure, the adapter is soldered onto the PCB of the key and connected to the ABPROG programmer.

Note: This ABPROG function will allow you to use any HITAG Key with any vehicle that uses HITAG as long as the keys are from the same HITAG Generation.

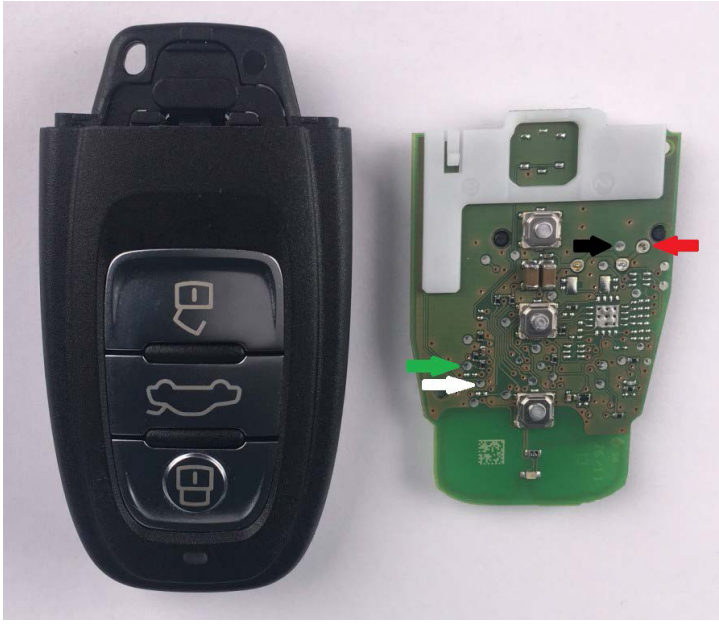
Description of the applicable cable colors used for soldering	
RED	+ BAT
BLACK	- GND
GREEN	DATA
WHITE	CLK (clock)

After the soldering, the DB-25 male side of the add-on needs to be connected to the DB-25 female connector of the ABPROG ZN045.
After which, the male DB-15 part of the ZN045 needs to be connected to the female DB-15 connector on the AVDI.

The following photos will show you how the connection points on the key PCBs look like, so that you can proceed with the soldering.

All Porsche Hitag type of keys (new Porsche Keys) have the following soldering points:

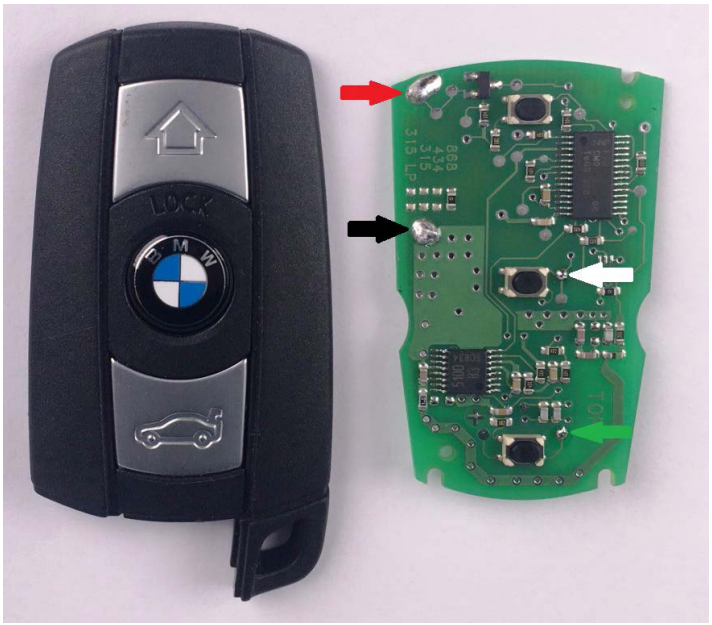
Audi BCM2 keys have the following soldering points



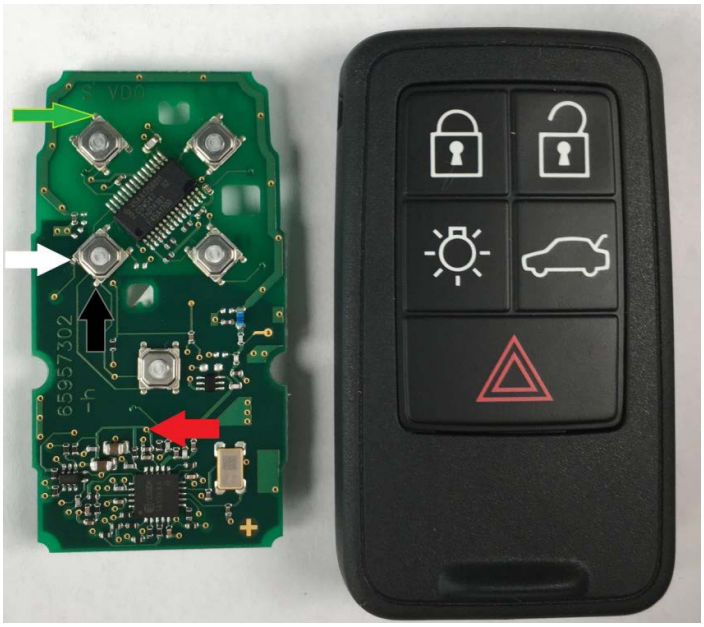
BMW F-Series 1st type Keys have the following soldering points:

BMW F-Series 2nd type Keys have the following soldering points:

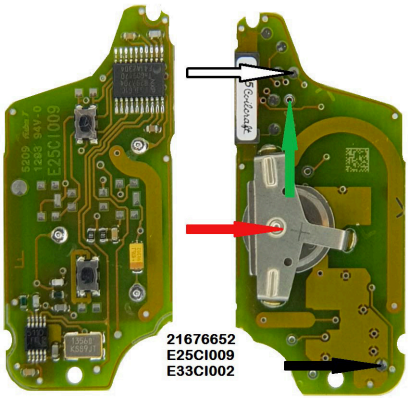
BMW E-Series Keys have the following soldering points

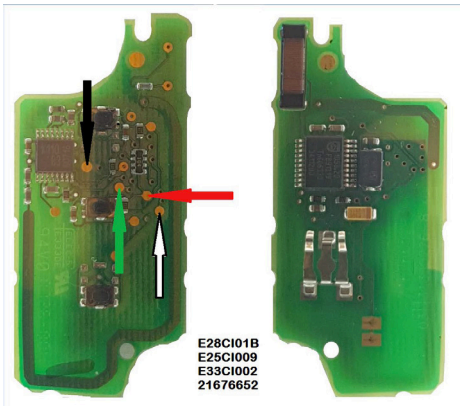


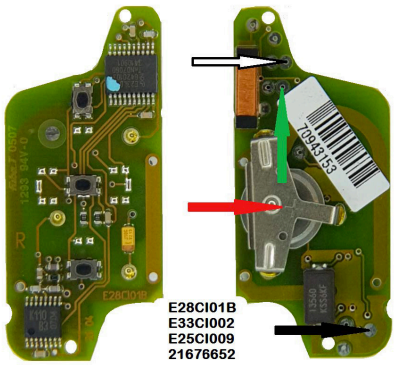
Volvo Keys have the following soldering points:



PSA keys have the following soldering points:







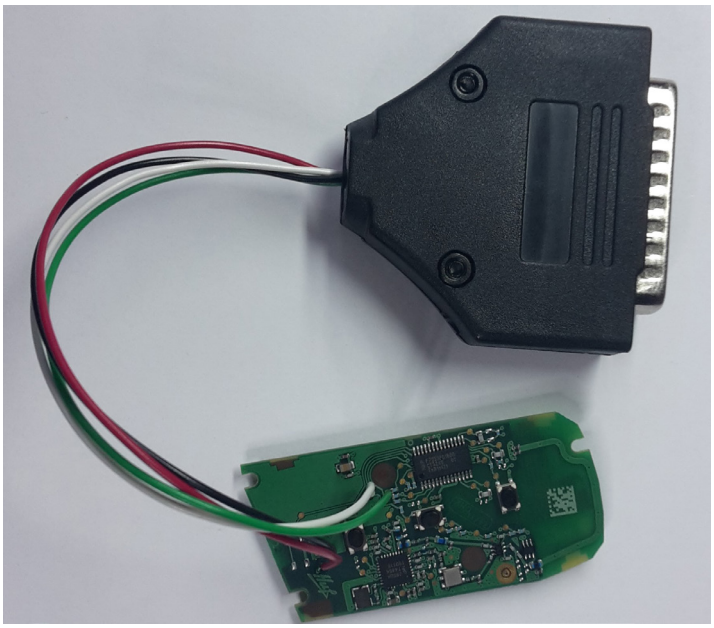
The last added keys for renew are the following:

*AUDI 8T0959754 433MHz R 233.453.111 02
*AUDI 8T0959754A 315MHz R 233.453.111 02
*AUDI 8T0959754F 433MHz K 233.453.111 02
*AUDI 8T0959754F 433MHz K 233.453.111 05-06
*AUDI 8T0959754F 433MHz K 233.453.111 05-06
*AUDI 4G0959754G 315MHz K 233.453.111 05-06
*AUDI 4H0959754G 315MHz K 233.453.111 05-06
*AUDI 4H0959754K 868MHz K 233.453.111 05-06
*AUDI 8T0959754 433MHz R 233.453.111 05-06
*AUDI 8T0959754D 868MHz R 233.453.111 05-06
*AUDI 8T0959754G 315MHz K 233.453.111 05-06
*AUDI 4G0959754BP 315MHz K 233.453.211 01-02
*AUDI 4G0959754DB 315MHz K 233.453.211 01-02
*AUDI 4G0959754DC 315MHz K 233.453.211 01-02
*AUDI 4H0959754DA 433MHz K 233.453.211 01-02
*AUDI 4H0959754DB 315MHz K 233.453.211 01-02
*AUDI 8K0959754BR 868MHz K 233.453.211 01-02
*AUDI 8K0959754D 868MHz K 233.453.211 01-02
*BMW F HUF5662 315MHz
*BMW F HUF5663 433MHz
*BMW F HUF5767 433Mhz
*BMW F 5WK49662 433MHz
*BMW F 5WK49663 315MHz
*BMW E 5WK49127 315MHz REMOTE
*BMW E 5WK49145 868MHz KEYLESS
*BMW E 5WK49147 315MHz KEYLESS
*PORSCHE 7PP959753BN 434MHz
*PORSCHE 7PP959753BQ 315MHz
*PORSCHE 7PP959753BM 315MHz
*PORSCHE 7PP959753BS 434MHz
*VOLVO 5WK49266 900MHz
*RANGE ROVER 5E0U40247 434MHz
*MITSUBISHI G8D 644M
*PSA 21676652
*PSA E33CI002
*PSA E25CI009
*PSA E28CI01B

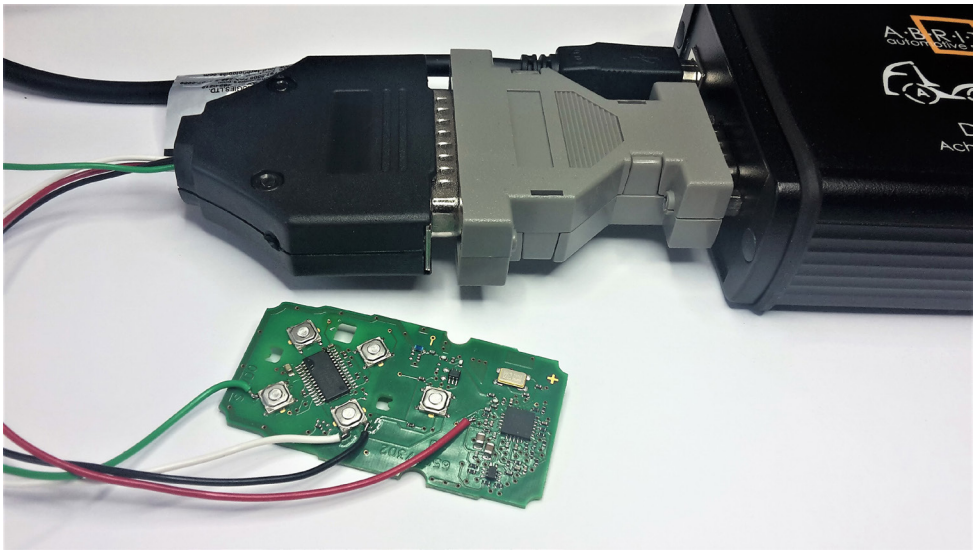
*CHR JEEP DODGE KOBOTO4A
*BUICK 13500224(13584825) 315MHz
*BUICK 13500225(13584825) 315MHz
*OPEL ASTRAJ/INSIGNIA 13500234 433MHz 3BTN
*CHEVROLET 13500319(13584829) 315MHz 5BTN
*CHEVROLET 13575163 433MHz 2BTN
*CHEVROLET 13575175 433MHz 3BTN
*CHEVROLET 13500221 315MHz
*GM KEYLESS 433MHz 5BTN
*CADILLAC NBG009768T 315MHz 5BTN KEYLESS

Note: If a wiring diagram is missing in the software, please send an email to support@abrites.com together with your AVDI ID and a picture of the key you want to renew with its product version.

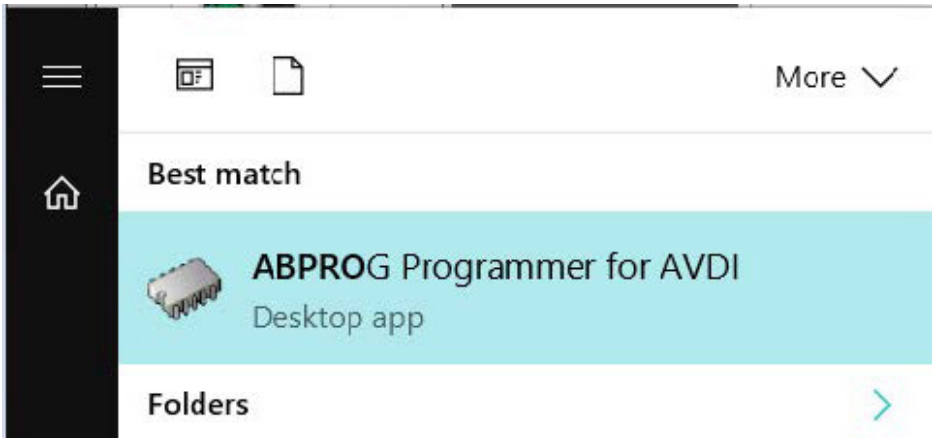
The following photos will show you how a soldered PCB looks like. The Example is of a BMW F-Series
HUF Key PCB:

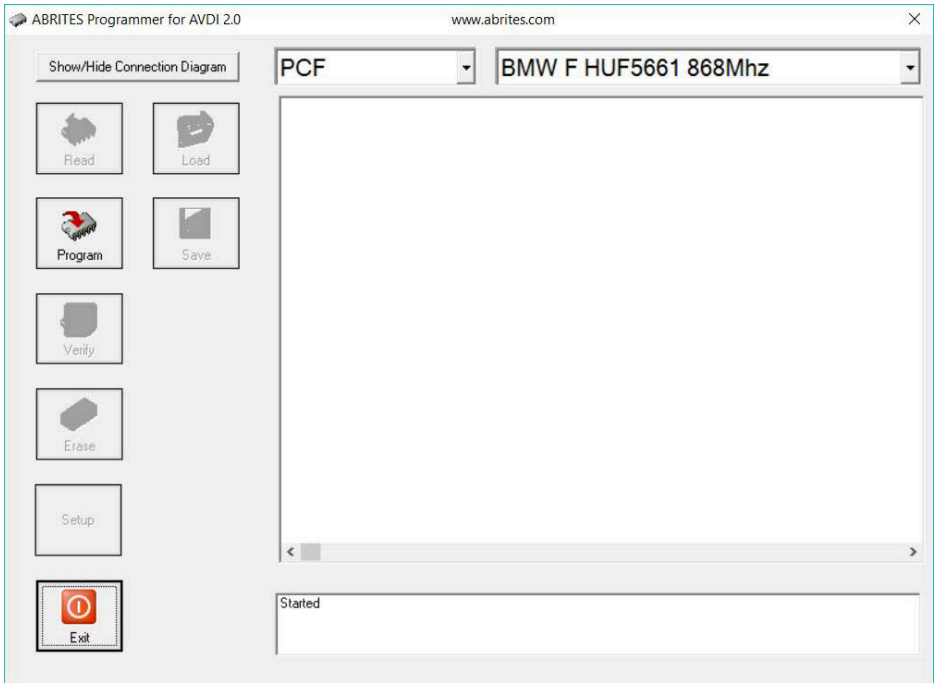


You can connect the adapter to the ABPROG adapter to AVDI as shown in the picture below:

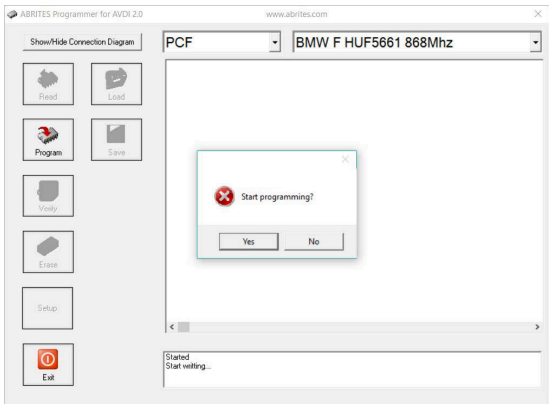


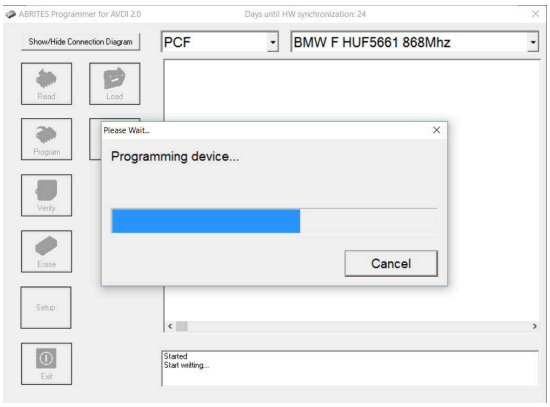
Once the cables of the ABPROG Adapter are soldered to the PCB, the ABPROG software can be started:



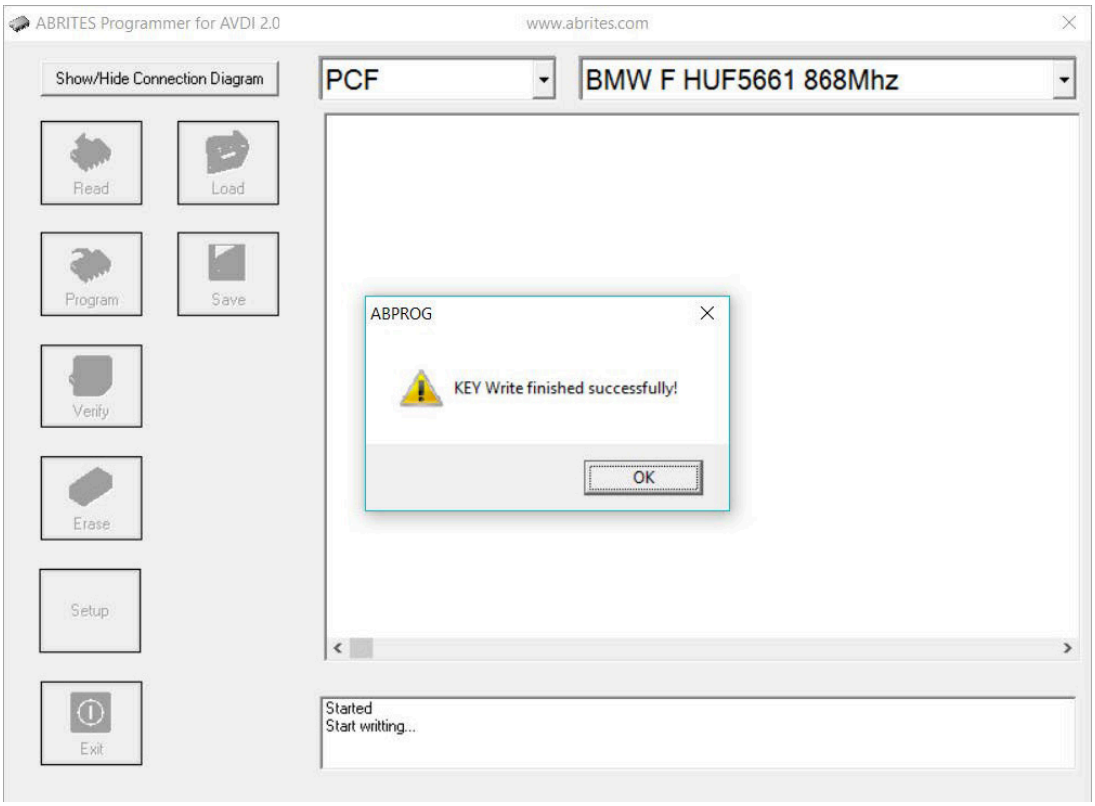


Select the “PCF” Option from the drop-down menu and the PCB model you are about to renew. After the desired options are selected, you can click on “Program” to renew the key and make it virgin. Click on “Yes” to confirm the renewal process.





Once the procedure is completed, you will see the “KEY Write finished successfully message”. This means that the key is now renewed and made virgin. You can continue with programming the key to another car.



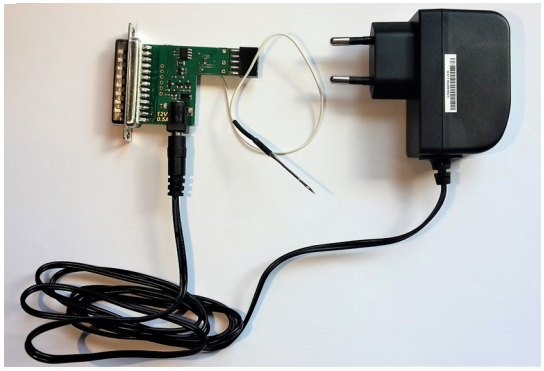
7. ZN055 - ABProg EWS3 Adapter

The Abrites ABPROG EWS3 Reader (ZN055 - ABPROG EWS3 adapter) allows you to read the EWS3 Dump from the EWS3 cars in order to program a key, and it is very useful when working on the BMW models. Supported vehicles:
BMW E46/E53/E85/E83/E39/E38/E52 (equipped with a EWS3 module)

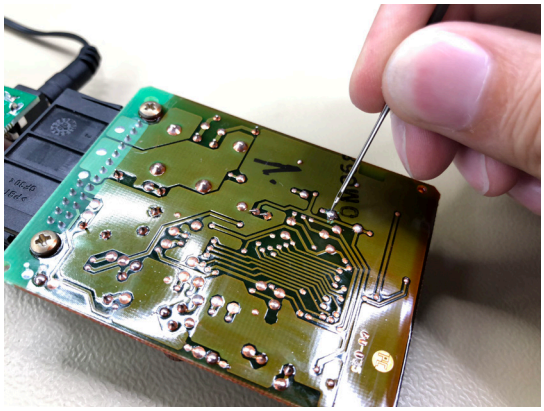
The tool attaches to the ABPROG programmer which attaches to the AVDI interface in order to read the EWS3 dump.

Once you have read the EWS3's dump, you will be able to save it on your computer. Then you will be able to load this dump in the PROTAG software and program a key using it. With the help of the EWS3 Adapter you will no longer need to use third party EWS3 Programmers to read the EWS dump.

ZN055 - ABPROG EWS3 adapter

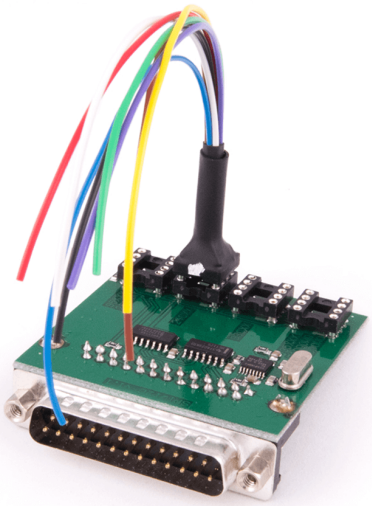


Connection diagram and Boot Pin on EWS



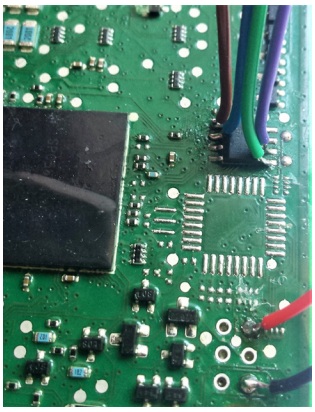
8. ZN057 EEPROM Adapter

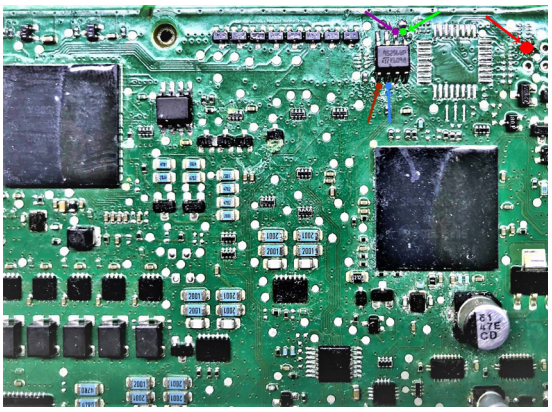
This is a wire extender for the ZN031 - ABPROG EEPROM/BCM adapter, used to read chips without removing them from the PCB in tasks such as reading the EEPROM of the FEM/BDC module in BMW F-series vehicles.



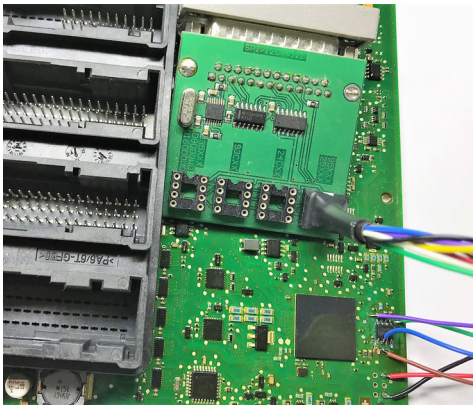
A·B·R·I·T·E·S automotive solutions

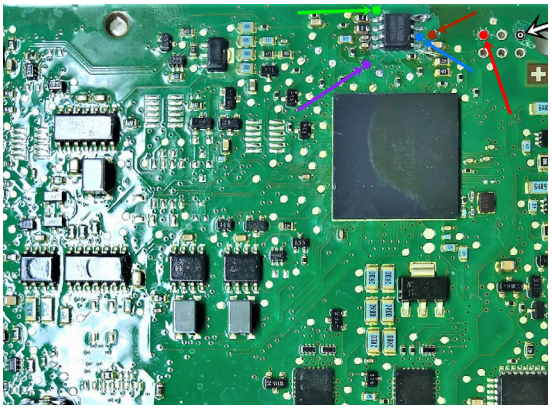
The photo below shows how to connect to a BMW BDC and a FEM unit to read the EEPROM:





The photo below shows how to connect to a BMW BDC and a FEM unit to read the EEPROM:





9. ZN078 - V850ES ADAPTER for ABPROG

The ZN078 adapter is the updated version of the ZN034 flat cable, developed and designed by Abrites. It is used in procedures like reading and writing processors which require communication via separate RX/TX lines.

Main functionalities:

- **Reading, erasing and writing unlocked V850ES MCUs**
- **Reading and writing all other modules where a direct connection to the PCB is required**

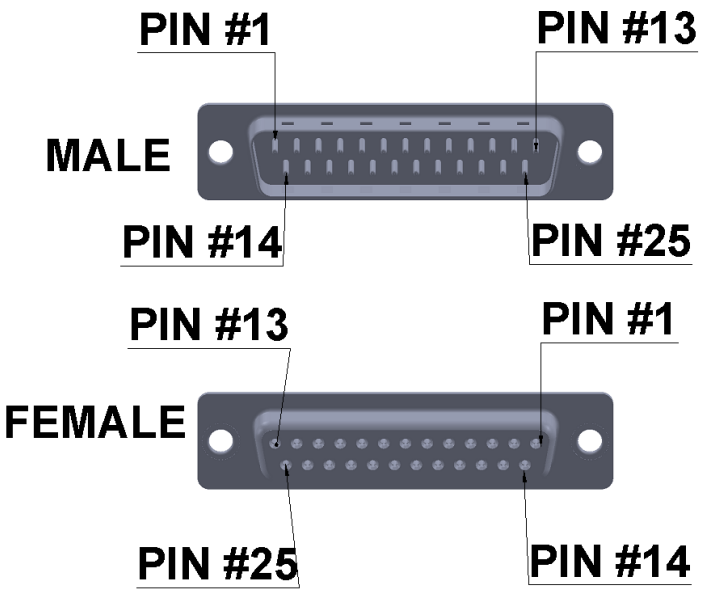
The adapter is used with the Abrites ABPROG programmer (ZN030) and is included in the ZN030 base package.

DB25 Connector:

Purple Wire - RX*
Blue Wire - TX*
White Wire - FLMD0
Black Wire - GND
Red Wire - +5V*
Green Wire - Reset

10. DB25 Male Connector

This connector is used if you do not own a particular adapter used with the ABProg, thus, you will be able to make your own adapter as per the task required.



Here is how to use the DB25 adapter as some of the additional adapters intended to work with ABProg programmer:

- ZN046 PIN OUT:

PIN 1 - - Red wire
PIN 2 - - Red wire
PIN 3 - - Red wire
PIN 4 - - Red wire
PIN 5 - RX - Green Wire
PIN 6 - TX* - White wire
PIN 14 - GND - Black wire
38K resistor between PIN 6 and PIN 14

- ZN058 PIN OUT

PIN 5 - RX* - Purple* wire
PIN 6 - TX* - Purple* wire
PIN 13 - FLMD0 - White wire
PIN 14 - GND - Black wire
PIN 20 - +5V* - Red wire
PIN 25 - Reset - Green wire
10K resistor between PIN 5 and PIN 20
1N4148 led between PIN 5 and PIN 6

- ZN078 PIN OUT:

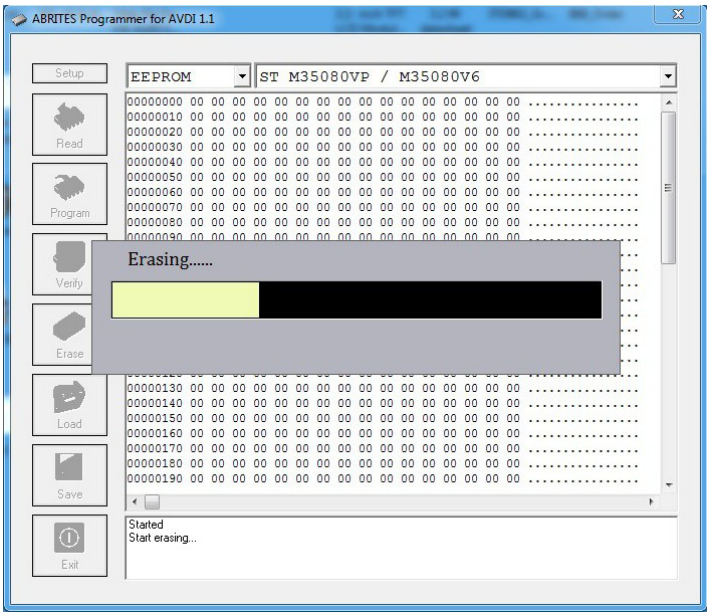
PIN 5 - RX* - Purple* wire
PIN 6 - TX* - Blue wire
PIN 13 - FLMD0 - White wire
PIN 14 - GND - Black wire
PIN 20 - +5V* - Red wire
PIN 25 - Reset - Green wire

- ZN086 MC9S12 ADAPTER for ABPROG

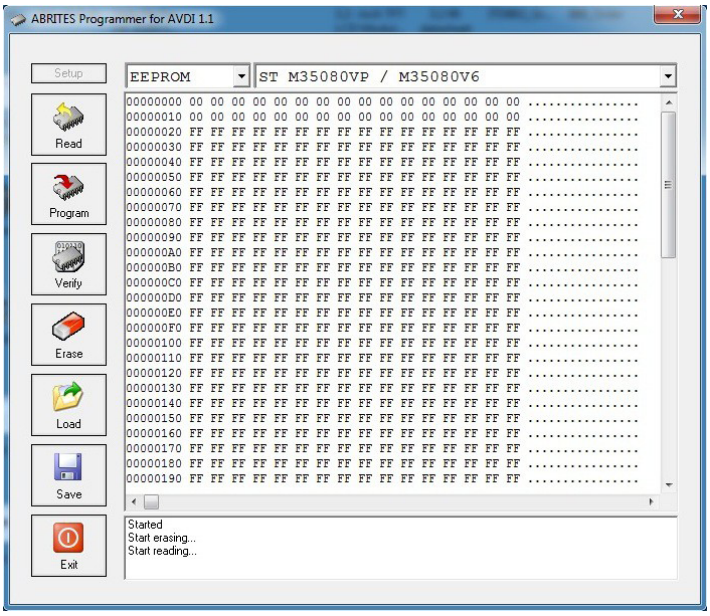
PIN 14 - GND - Black 0.25
PIN 21 - +5v - Red 0.25
PIN 11 - RST - Yellow 0.11
PIN 19 - BKGD - Green 0.14

11. Erasing Incremental EEPROM

Once you select the “EEPROM” use button “Erase Incr.”.



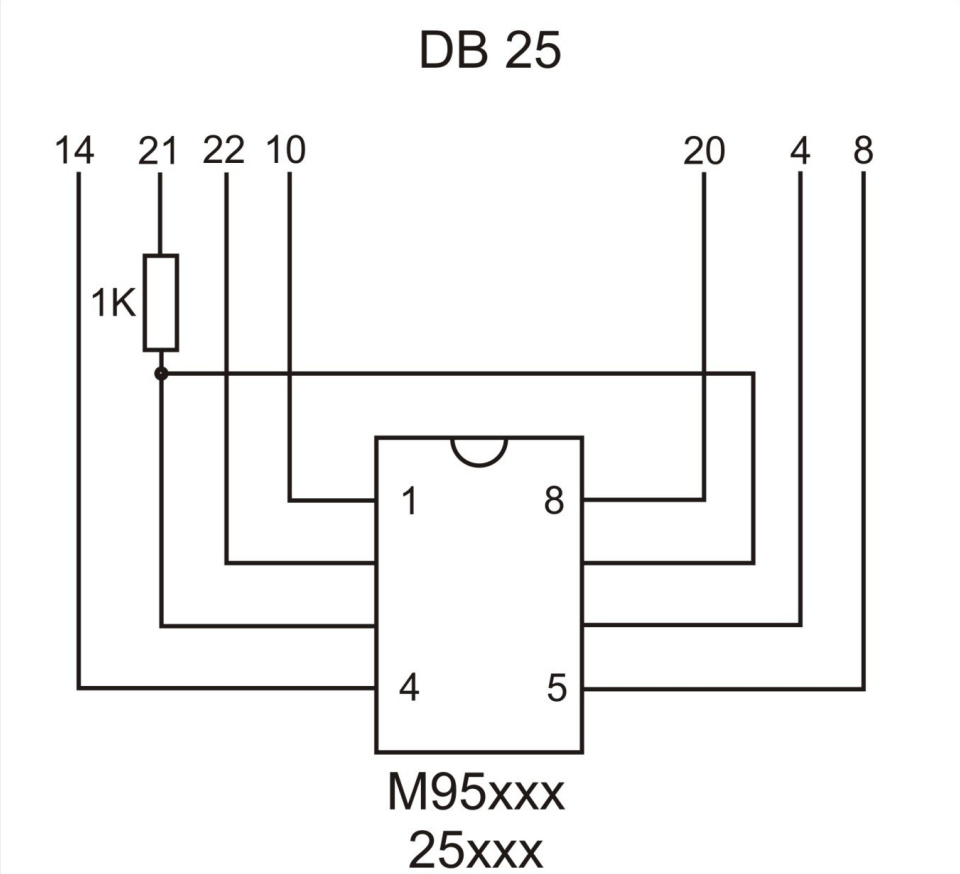
Keep in mind that the time to erase “M35080VP/M35080V6” could reach 90 seconds!



After erase finish you can write the new data using the button “Load” and “Prog Incr.”.

12. Connect “ZN030-ABPROG” without “ZN031-M35XXX/SPI/I2C adapter”

You can use your “ZN030-ABPROG” for programming and reading of ordinary SPI EEPROM memory as M95080, M95160, M95320, M95640, M95128, M95256 without using “ZN031- M35XXX/SPI/I2C Adapter”. To do this you must connect the memory to DB25 connector in the manner shown in the picture.



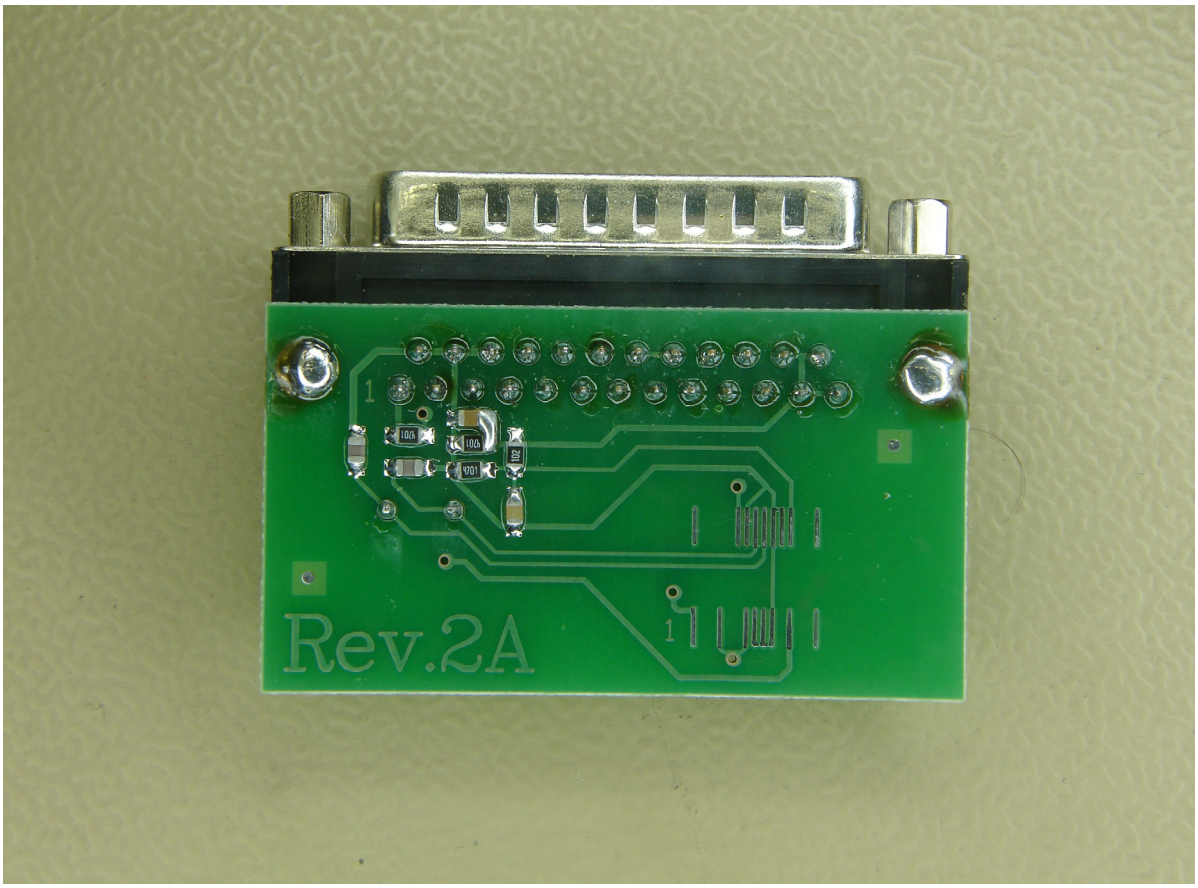
Keep in mind that the power from “ZN030-ABPROG” is 5V DC!

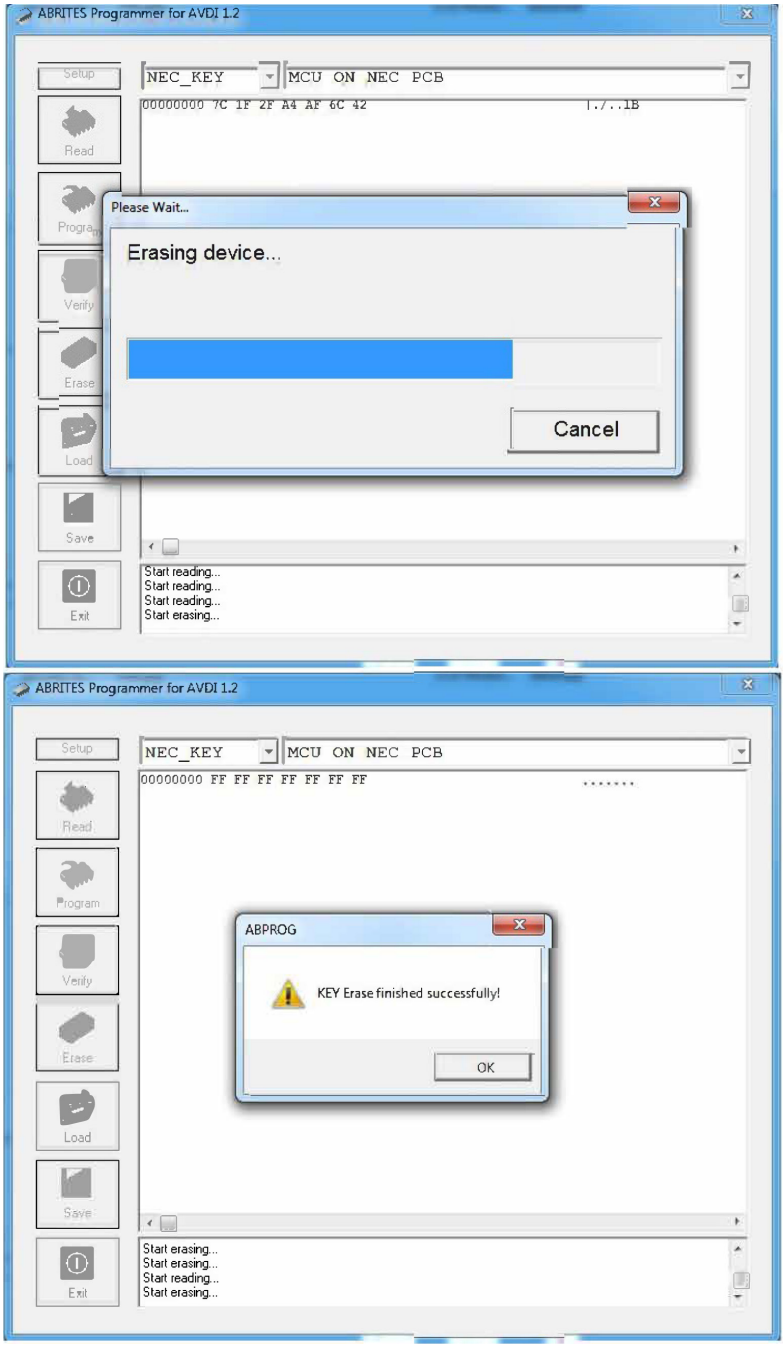
13. Read SSID, Erasing and Programming of NEC Key for Mercedes

All existing customers should have received a NEC board, on which to solder the NEC chip. For all existing customers - if you send to support@abrites.com the dump from the EZS we will send you back a working key dump and you will not need to worry about virginizing ECU, 7GTronic and so on.

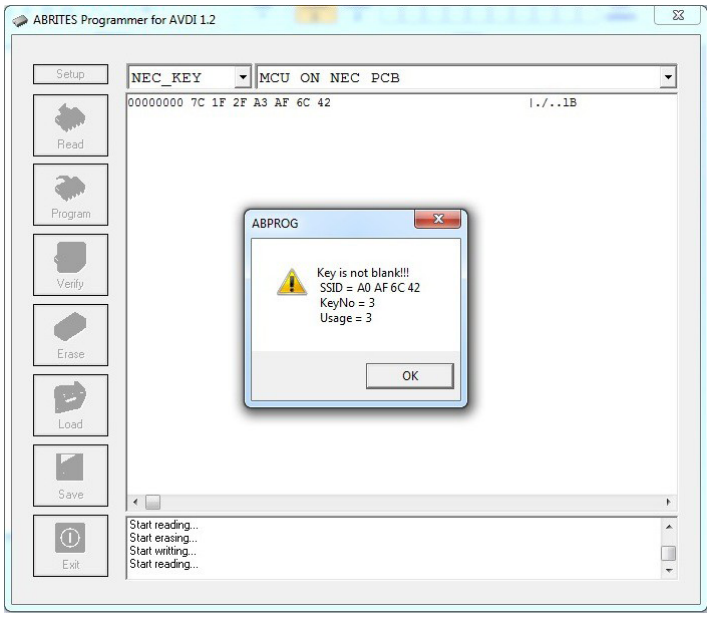
13.1 Erasing NEC chip

The NEC chip should be soldered on the NEC PCB, which is provided by Abrites. Here is how the erasing procedure looks like:

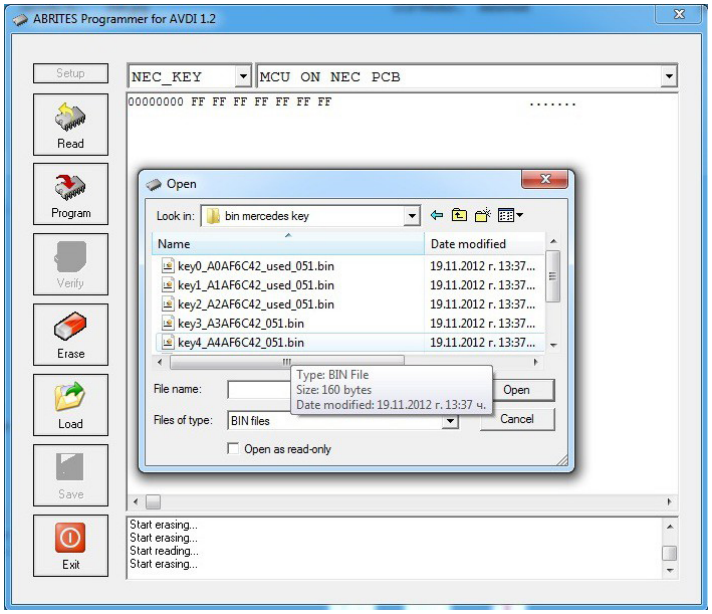



ABRITES Programmer for AVDI 1.2
Setup
NEC_KEY
MCU ON NEC PCB
00000000 7C 1F 2F A4 AF 6C 42 |./..lB
Read
Program
Verify
Erase
Load
Save
Exit
Please Wait...
Erasing device...
Cancel
Start reading...
Start reading...
Start reading...
Start erasing...
ABRITES Programmer for AVDI 1.2
Setup
NEC_KEY
MCU ON NEC PCB
00000000 FF FF FF FF FF FF FF ....
Read
Program
Verify
Erase
Load
Save
Exit
ABPROG
KEY Erase finished successfully!
OK
Start erasing...
Start erasing...
Start reading...
Start erasing...

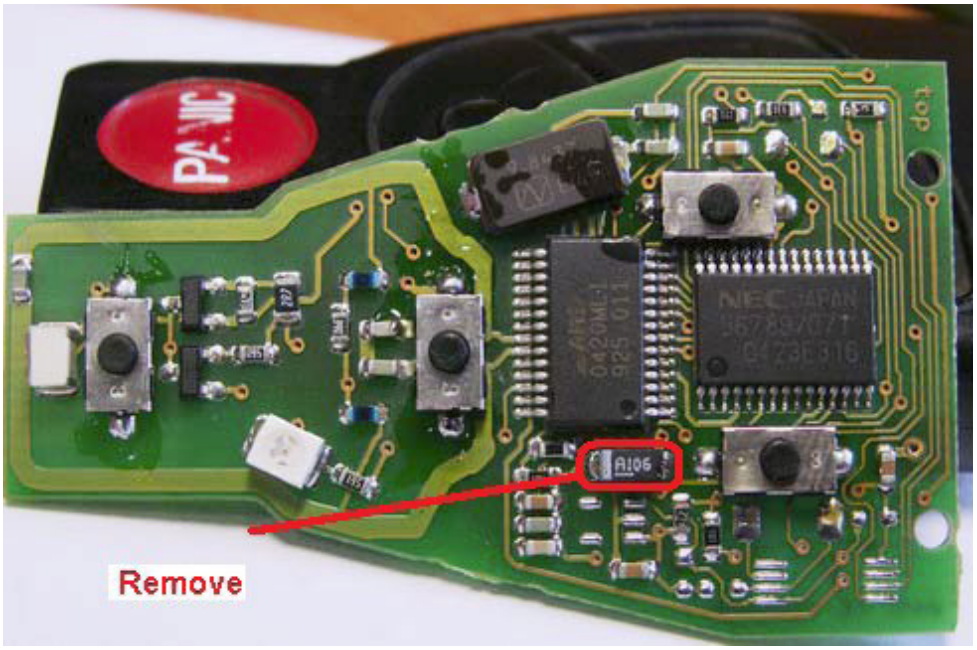
13.2 Reading SSID

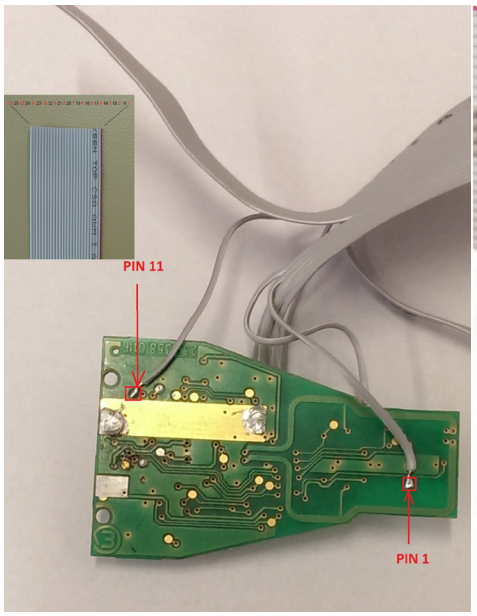


13.3 Programming NEC chip



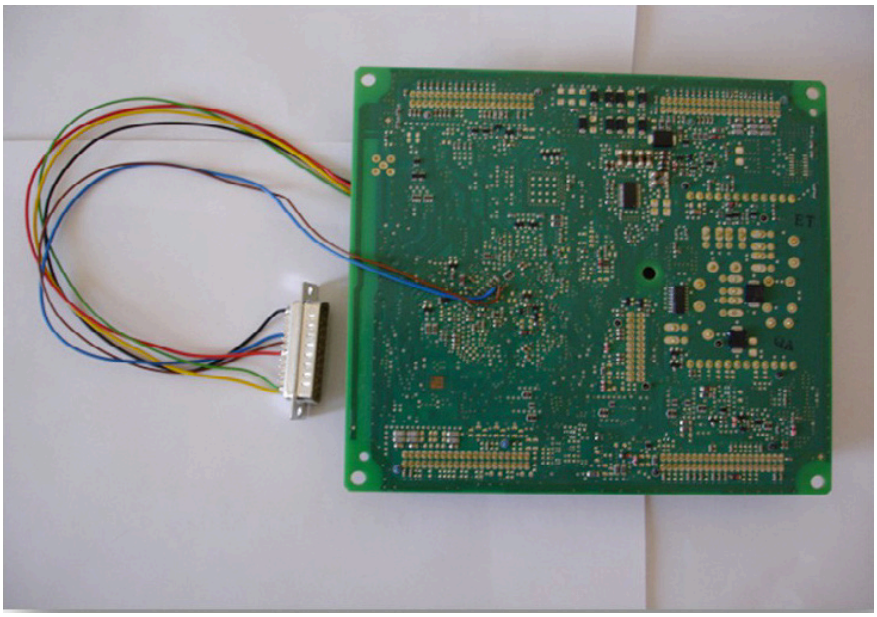
Programming the CPU directly on the key using ABPROG flat cable.



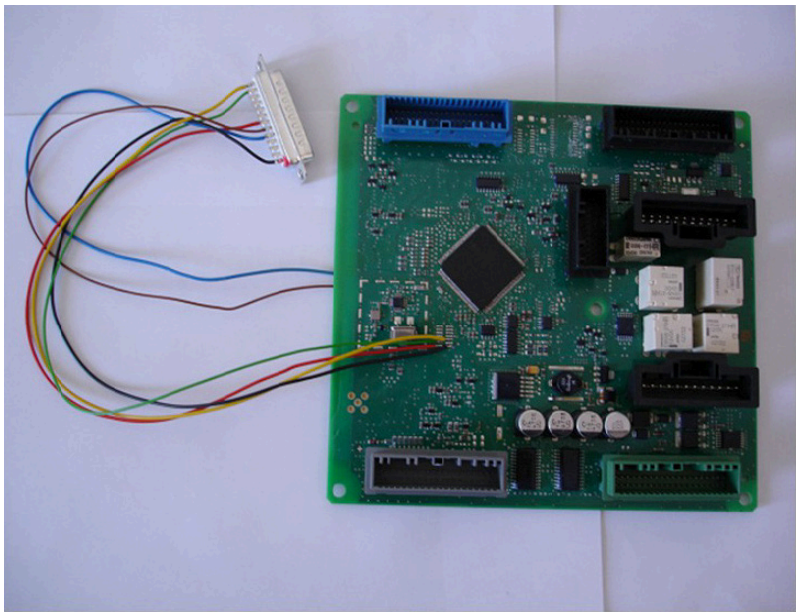


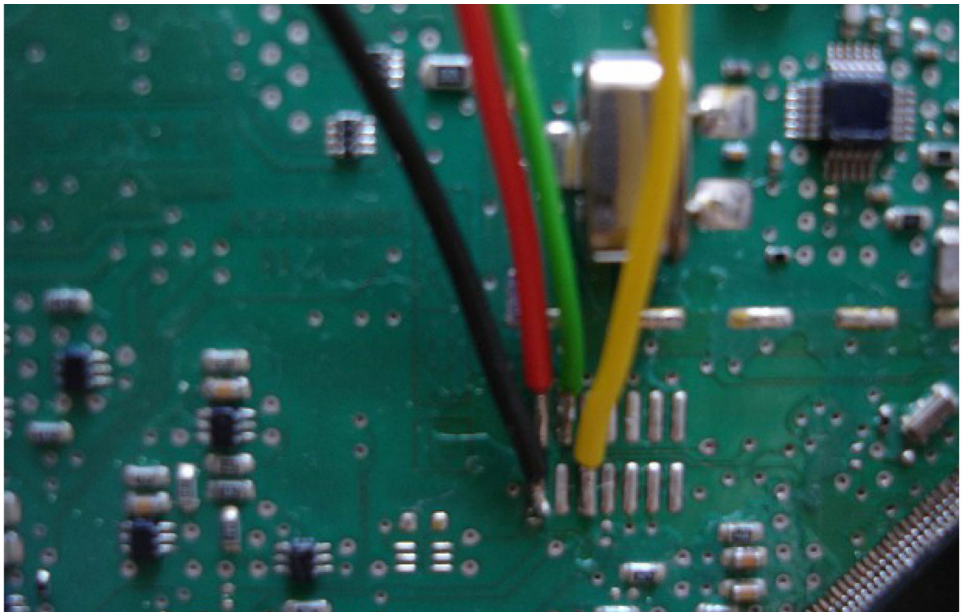
NOTE: FOR CUSTOMERS WHO HAVE "ZN002" AFTER FIRMWARE UPGRADE CAN BE USED AS "ZN030-ABPROG".

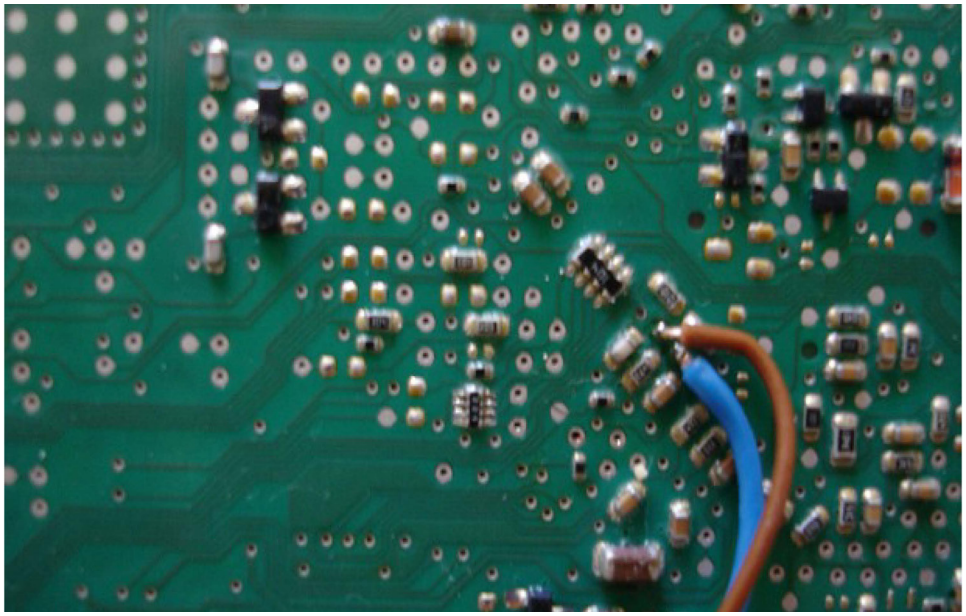
To read the immobilizer with the ABPROG you need to solder as showed on the pictures below.

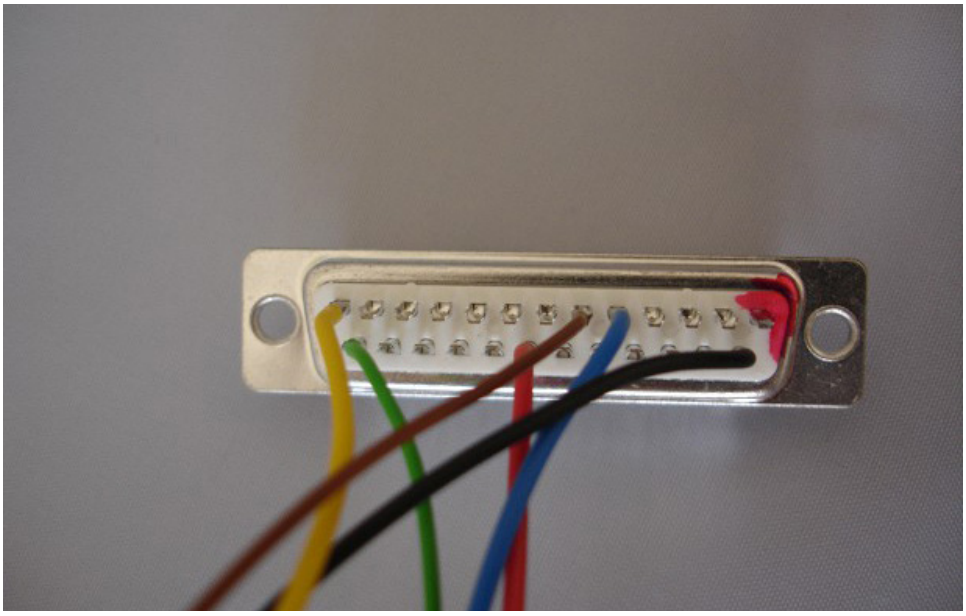


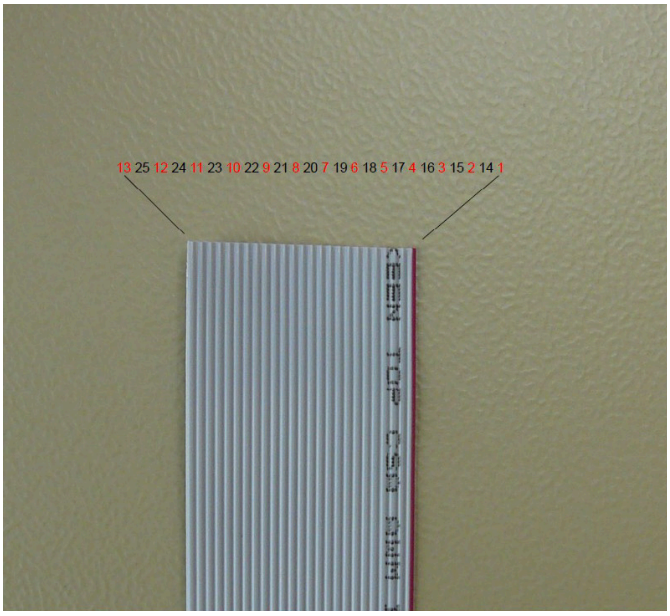
In the ABPROG you should select "MCU" and the "Renault (X95) BCM" option.











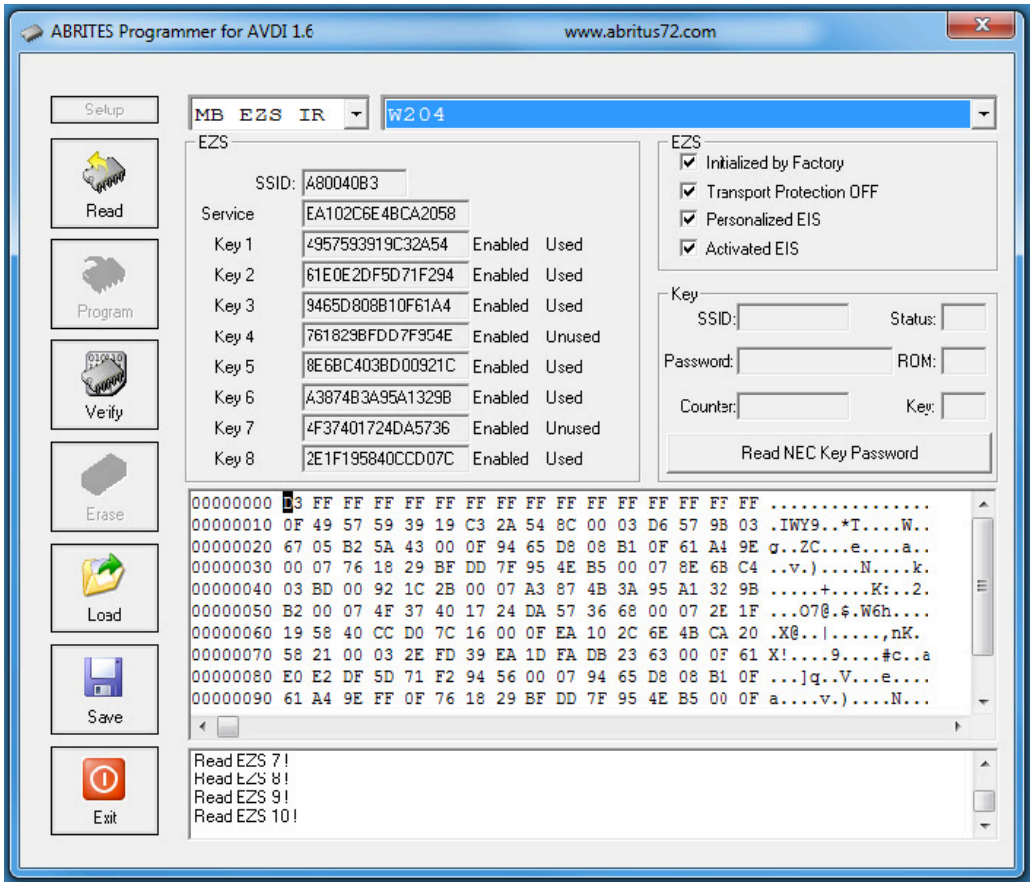
For Renault and Audi BCM

Blue - 5; Red - 20; Black - 14; Green - 25; Brown - 6; Yellow – 13;

14. Hash reading without password from the EZS via IR. Password reading from NEC MCUs version 57

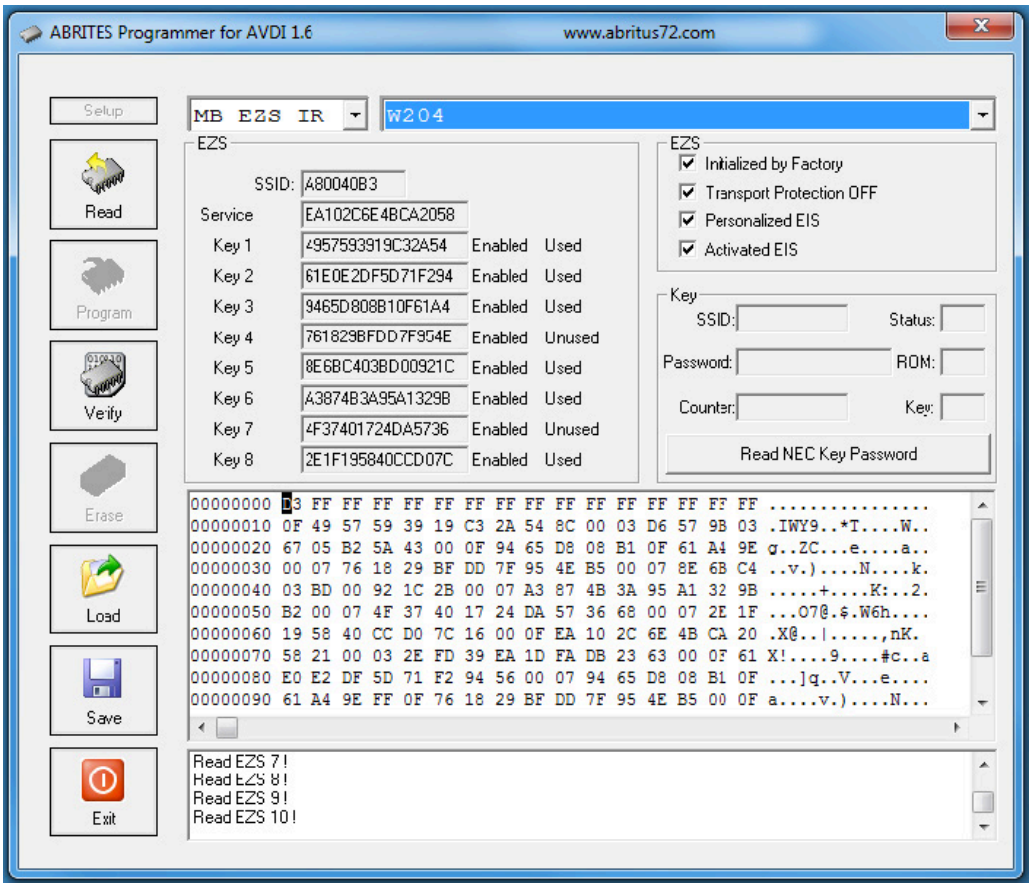
14.1 EZS hash reading through IR

Please use the ZN036 adapter to connect to the EZS. From the drop down please select MB_EZS_IR and the model i.e. W204. Press the read button and place the IR adapter in the key fob. After reading the key fob the hashes will be displayed. Please note that for some models you will need to take the key in and out of the fob multiple times.



14.2 NEC MCU version 57 password reading

Place the NEC processor from the key on the adapter plate (part of the ZN036). Press the "READ NEC KEY PASSWORD" and wait until the reading is over. This process can take from several seconds up to a few minutes. After successfully reading the password you will see the SSID and password fields among other details.



When you have the full dump, the hash files + the password you can save the file and use it later in order to generate the dumps using the Abrites diagnostics for Mercedes.

15. ZN086 - MC9S12 ADAPTER for ABPROG

Using the ZN086 you can read unlocked MC9S12's from the xExxx series - PFlash, DFlash and EEPROM data, save them, and later write to another module. The whole procedure takes minutes and allows you to adapt these modules in the vehicle (clone the donor module onto the new/used one).

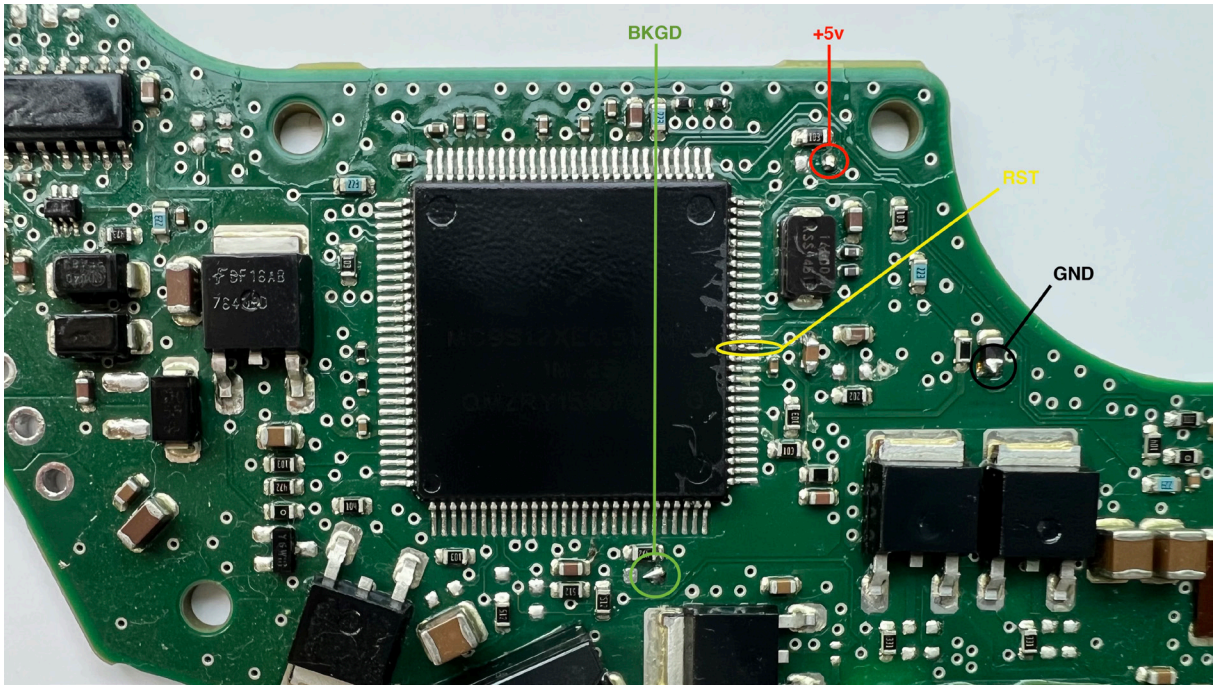
Important: The PIN that needs lifting, is specific for each processor, and you need to find that information first. Since there are many variations, you will need to do your own research and get to the processor's data sheet. The PIN that needs lifting is the "RST" or reset PIN.

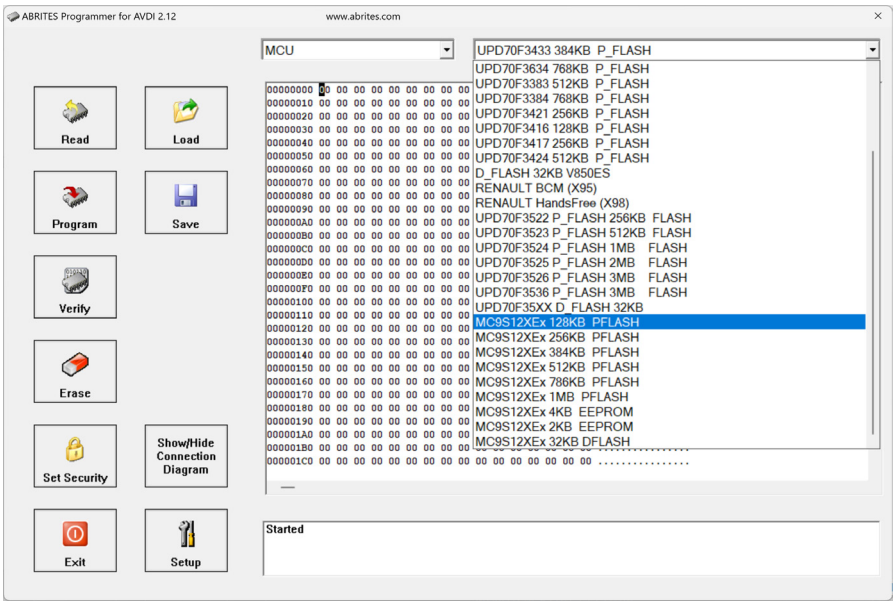
The ZN086 adapter is soldered onto four points on the PCB (one of which is the lifted pin) and then connected to the ABPROG > the ABPROG is connected to AVDI, and AVDI to your laptop.

ABPROG upgraded software is used, but the procedure can also be done with the Classic one.

First, you need to read PFlash and EEPROM, save them, and then program them on the replacement module's PCB.

MC9S12 processor is used in a variety of modules, such as DSM and ISM in FBS4 Mercedes-Benz vehicles, etc.



Below you may find a picture of the adapter, and where the option in the software is located - from the main screen you need to click “MCU” and find the options.

For more details on how the ZN086 is used, please check the following video