A·B·R·I·T·E·S
automotive solutions

ABRITAES DIAGNOSTICS FOR MERCEDES TRUCKS

User manual
version 1.1

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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Safety information

The Abrites products are to be used by trained and experienced users in diagnostics and reprogramming of vehicles and equipment. The user is assumed to have a good understanding of vehicle electronic systems, as well as potential hazards while working around vehicles. There are numerous safety situations that cannot be foreseen, thus we recommend that the user read and follow all safety messages in the available manual, on all equipment they use, including vehicle manuals, as well as internal shop documents and operating procedures.

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.

Table of contents

List of revisions

Date	Chapter	Description	Revision
11.11.2022	ALL	Document Created	1.0
02.02.2023	3.5	Chapter Created	1.1
02.02.2023	ALL	Minor Changes to add Setra	1.1

1. Introduction

ABRITES Diagnostics for Mercedes Trucks is a powerful automotive software designed for profession-als who need to perform special functions such as key learning and module replacement on Mercedes Trucks. To use the software, you will need an AVDI interface and a Windows-based PC running Windows 7 or later. It is also recommended to have the latest software version installed, active AMS, and a stable internet connection for optimal operation.

With ABRITES Diagnostics, you can perform a range of advanced diagnostics and programming functions on Mercedes Trucks, including programming new keys, adapting new control modules, and performing security-related procedures. The software is designed to be user-friendly, with an intuitive interface that makes it easy to access all the functions you need.

Overall, ABRITES Diagnostics for Mercedes Trucks is a valuable tool for automotive professionals who need to perform complex diagnostic and programming functions on Mercedes Trucks. With its advanced features and user-friendly interface, it can help you work more efficiently and effectively.

## 2. Abrites diagnostics for Mercedes Trucks

ABRITES Diagnostics for Mercedes Trucks is not intended to provide general diagnostic functionalities for Mercedes Trucks. Instead, it is a specialized software that is designed to perform specific functions, including key learning and module replacement on Mercedes Trucks. It is possible that diagnostic functionalities could be added to the ABRITES Diagnostics for Mercedes Trucks in the future as part of ongoing development efforts.

    Key Learning
    Module Replacementl

The Abrites FBS Manager for trucks is a specialized function used for programming keys and replacing FBS (DAS) modules in Mercedes trucks and buses, specifically those using the FBS3 system manufactured by Mercedes-Benz. These vehicles include the Actros, Axor, Arocs, Setra, and others based on the Mercedes Actros 963 MP4 platform. The FBS Manager function is an extension of the Abrites DAS Manager function and shares similar functionality.
It is accessed from the Mercedes icon of the main screen and the Truck icon as in the image below:
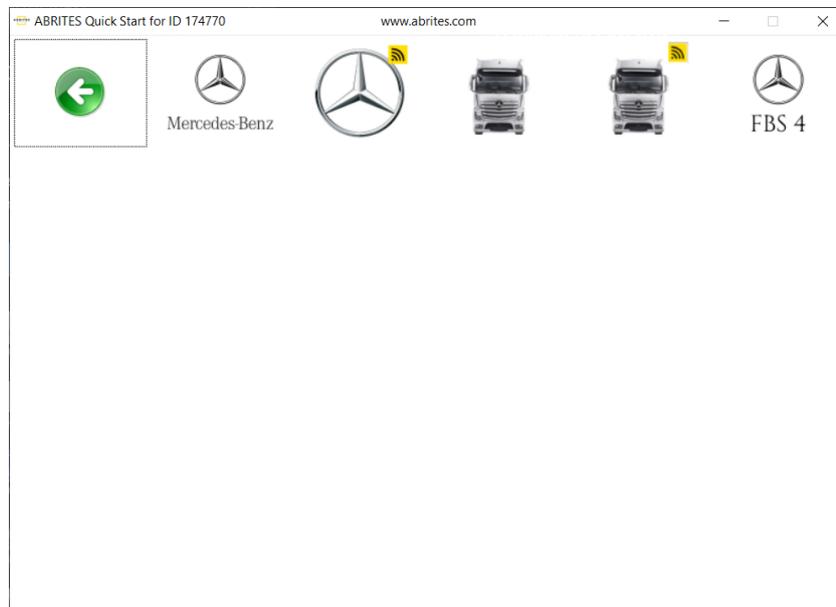
3. Required Connections

To utilize the Abrites FBS (DAS) Manager for Mercedes trucks, specific connections are necessary. There are two cases to consider:

1. When extracting passwords from the EIS/EZS in an All Keys Lost situation, a CB022 Mercedes Actros jumper cable is required.
2. When working on the ECU or TCU, an internal CAN connection is necessary.

In addition to these requirements, the following items are also needed:

- CB106 AVDI OBDII cable is required for working with trucks.
- ZN051 Abrites Distribution Box is required for fuse relay and internal CAN connections.
- ZN075 IR Adapter for Mercedes Actros is required for password extraction from EIS/EZS.
- ZN003 Protag Programmer (for Trucks) is required for key programming (ZN002 will not work).
- An internet connection.
- CB025 extension cable for the fuse of Setra buses key programming.

All of the necessary connections for Mercedes Actros and similar trucks can be made behind the glove-box compartment near the passenger's feet.

For Setra buses, the fuse box is located above the front right wheel, and the SAM of the Setra S515HD is also located in the same compartment, so the CAN wires are available there as well.

3.1 Getting Access for Actros

To remove the panel, first remove the plastic molding and side cover. Then, unscrew the screws to detach the panel.

After removing the panel, you will have access to everything needed for the specific connections.

In the second picture, you can see the bundle of wires that connects the CPC to the ECU units, where the CAN connection can be made.
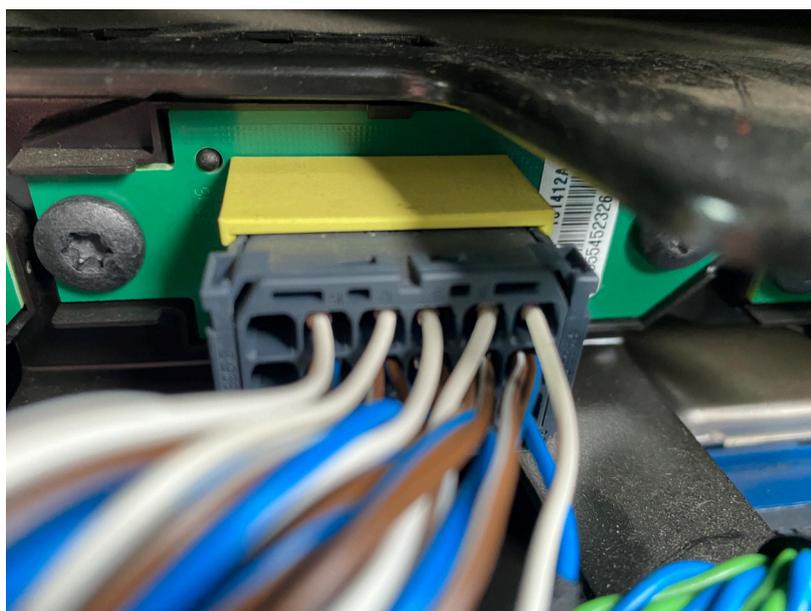
### 3.2 ECU and TCU Internal CAN Connections Actros

When working with ECU or TCU, you need to connect to the OBDII port of the truck **and the internal CAN-BUS of the truck simultaneously**. Connect the ZN051 to the AVDI, connect the OBDII cable to the DS-Box. Find the **internal CAN H (BLUE) and CAN L (WHITE) wires,** which connect the CPC and ECU units. Connect to them using the needle pinch connectors supplied with the ZN051 set, and make sure you use 3-11 slots on the DS-Box. Always refer to a factory wiring diagram because unlike with cars – trucks are not always the same color, this based on our experience so far.
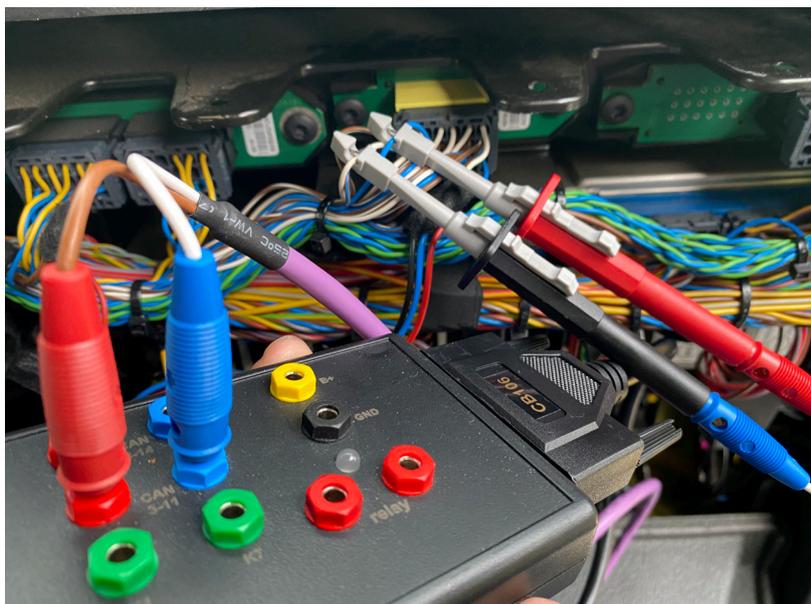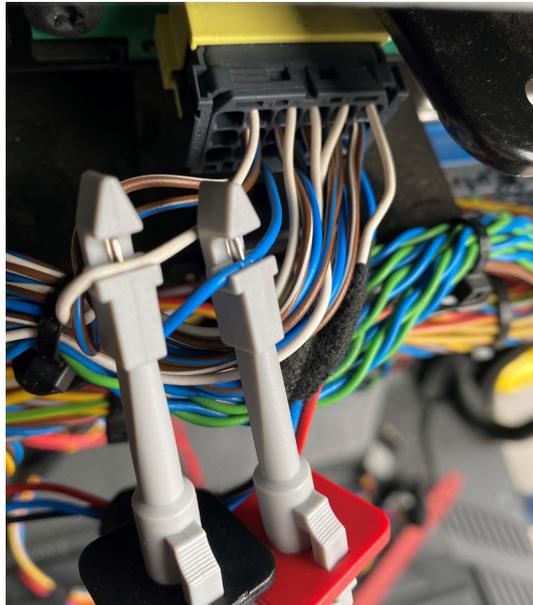
### 3.3 All Keys Lost Connections with Fuse 17 Actros

When working on these trucks in an All Keys Lost situation, there are two scenarios for connections, depending on whether the truck is equipped with fuse 17 or not.

If the truck is equipped with fuse 17, you need to remove the fuse and then insert the fuse relay cable (which is part of the ZN051 set) into the socket of the fuse for EIS/EZS password extraction. The fuse box is located in the passenger's foot compartment. Please refer to the picture below:
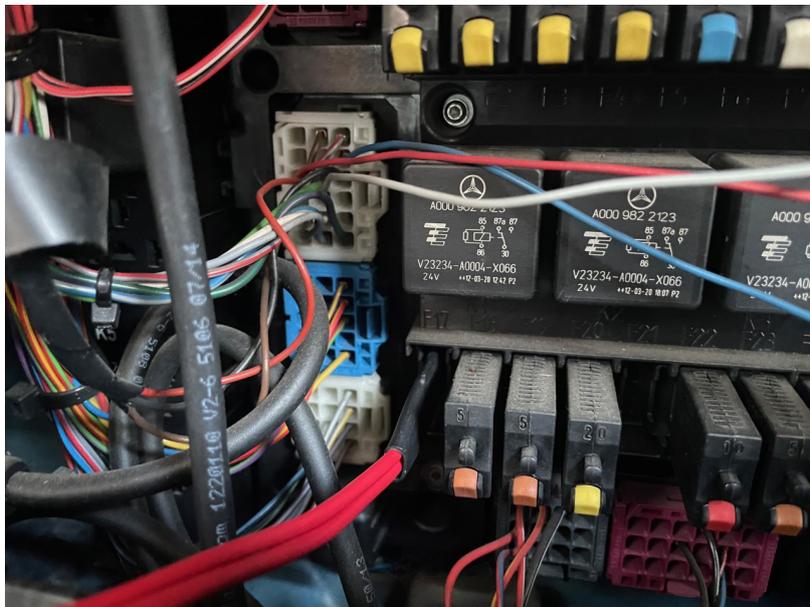
### 3.4 All Keys Lost Connections without Fuse 17, using CB022 Actros

If the truck is not equipped with fuse 17, you will need to use CB022 - Actros jumper cable. CB022 should be connected between the SAM (fuse box) and the EIS/EZS. There are three cables on the required connector (one of which is for the EIS/EZS power supply), and CB022 should be connected to this exact plug. Then, connect the fuse relay (red cable) from the ZN051 set. CB022 provides a fuse for password extraction to be added. The first picture shows the connector, which is the upper left one.
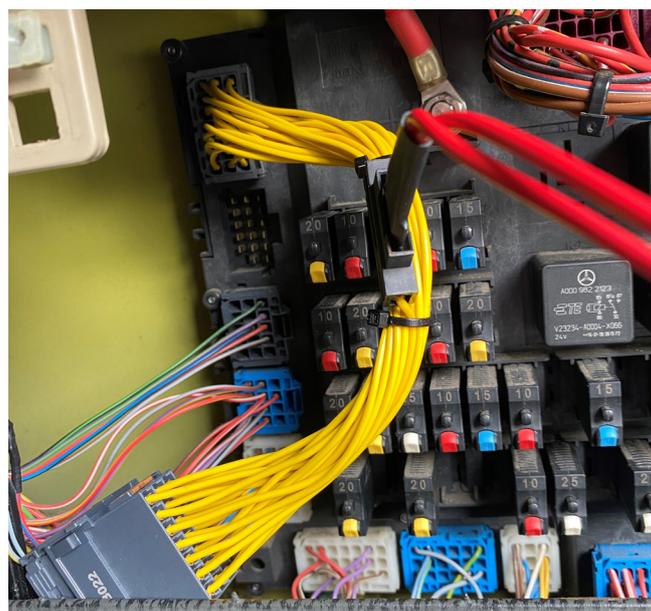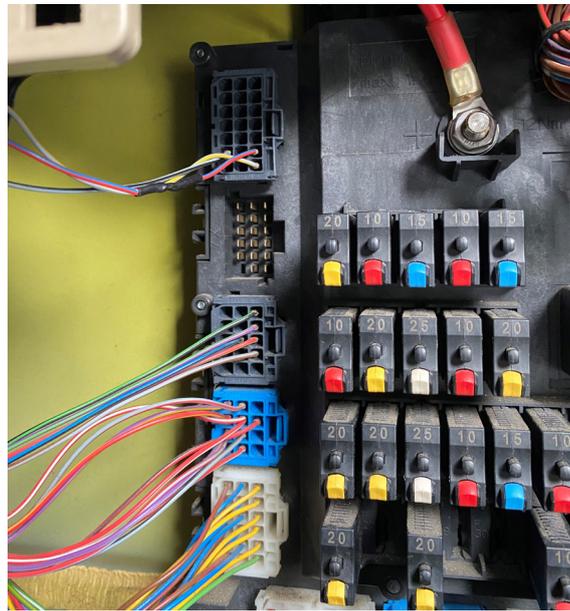
3.5 Fuse-box connections using CB025 Setra

To make the required connections to a Setra S515HD bus, follow these steps:

1. Locate the fuse box of the Setra, which is situated above the front right wheel.
2. Open the fuse box and find fuse 61 (F61).
3. Remove the fuse and connect the CB025 extension cable for the fuse relay.
4. Connect the CB025 to the fuse relay slots of the ZN051 DS Box.
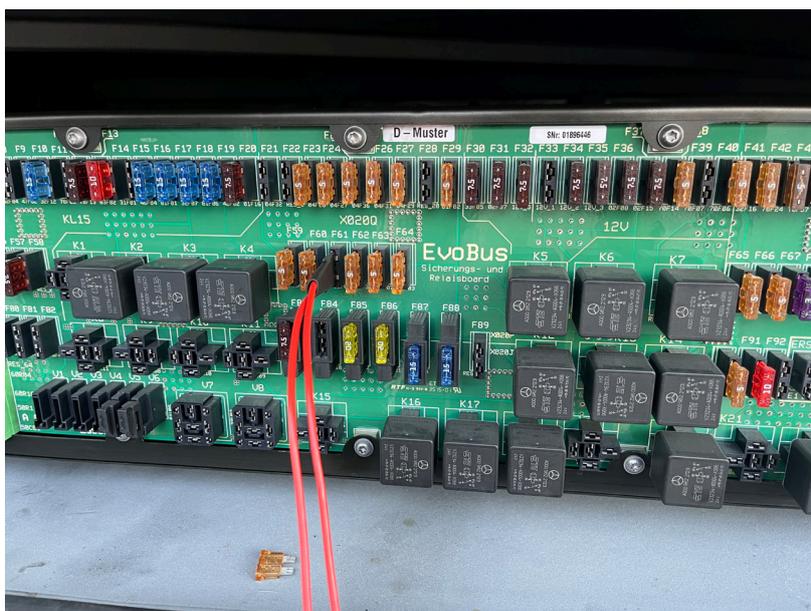
4. Main Screen Information.

From the main screen, click on the "Info" button to access the info screens. Once a connection to the DAS (FBS) modules in the truck is established using the Abrites FBS manager, you will have access to the DAS-related information screens of the following modules:

- EIS/EZS – Electronic Ignition Switch
- ECU- Engine Control Unit
- TCU – Transmission control Unit

In the Info screens, you can view the FBS data from the modules, such as the number of keys programmed, diagnostic variant, hardware supplier, serial number, VIN, SSID, and last key used, etc.
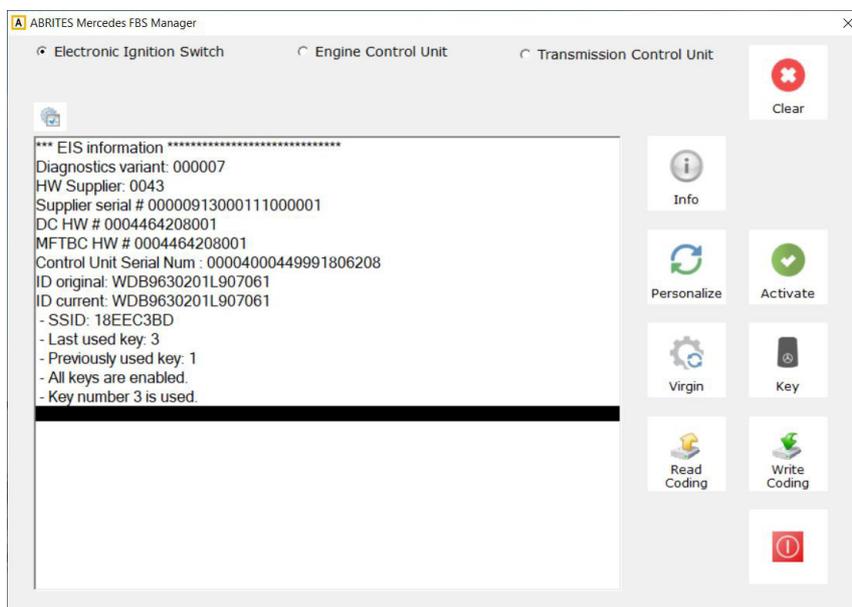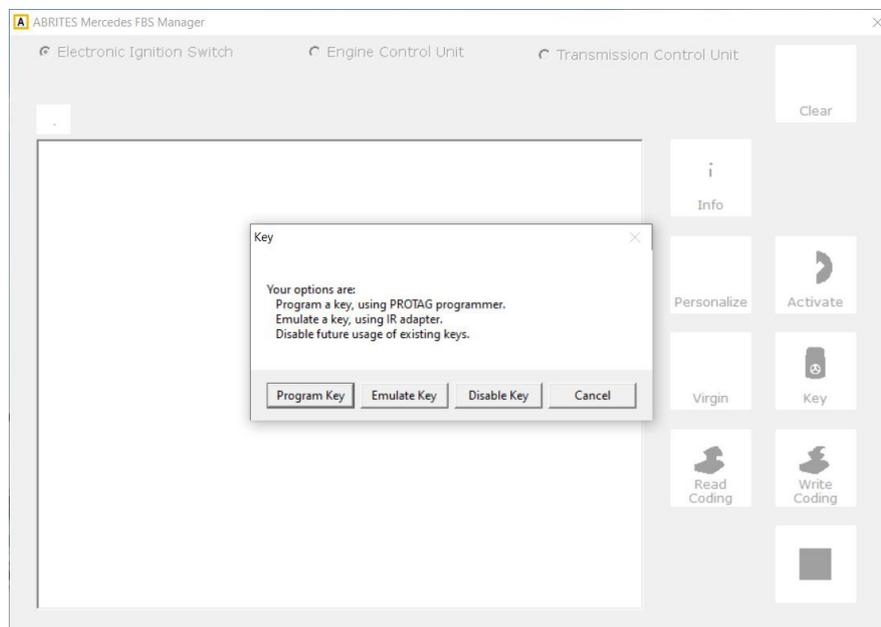
5. Key Learning

To program keys for any FBS3 and higher Mercedes vehicle, including trucks, you need to first extract the EIS/EZS password. This can be done by following the instructions in sections 3.2 and 3.3 of this user manual. Once the password is extracted, you can use the "Key" button in FBS (DAS) manager to program the keys. There are two methods to extract the password:

1. From a working key (only original MB Truck/Bus key): With this method, you will be prompted to insert the working key into the ignition and ZN003 ProTag programmer, and repeat the process several times until the password is extracted. Note that ZN002 does not support this procedure.
2. If all keys are lost, the password can be extracted from the EIS/EZS using the ZN075 IR adapter. In this case, you need to place the IR adapter in the EIS/EZS and wait for the password to be extracted.

The "Key" button also includes other options such as "Disable key" (which disables a selected key) and the option to "emulate a key" for the truck using ZN075 for emergency start. This function can be useful when the truck needs to be moved and no keys are available.

When you click on the "Program key" button, the next step is to connect your ZN075 IR adapter. It is essential to insert the IR adapter into the EIS/EZS and then remove it. After that, you can choose to work with a working key or if all keys are lost. Please note that the ZN051 distribution box is mandatory for password extraction from the EZS/EIS to work with the fuse relay. On-screen instructions guide you on the necessary connections, and it is highly recommended that you pay attention to them. All connection sequences and instructions are displayed for your convenience.

Now, the extraction from a working key is faster than ALL KEYS LOST, and the average result is to be expected between 500 and 1500 extracts. The average result time is constantly reducing over time. In order to program a new key to any of the supported trucks, it is compulsory to use the TA69 Abrites IR truck key. No other key can be programmed with the Abrites FBS manager.

ZN003 PROTAG is also obligatory for truck key programming because it is equipped with a truck key IR slot where you can program the key and read the password from working keys.

Each EIS/EZS comes with 8 positions for keys, and the software automatically selects the first available position to program a key in.
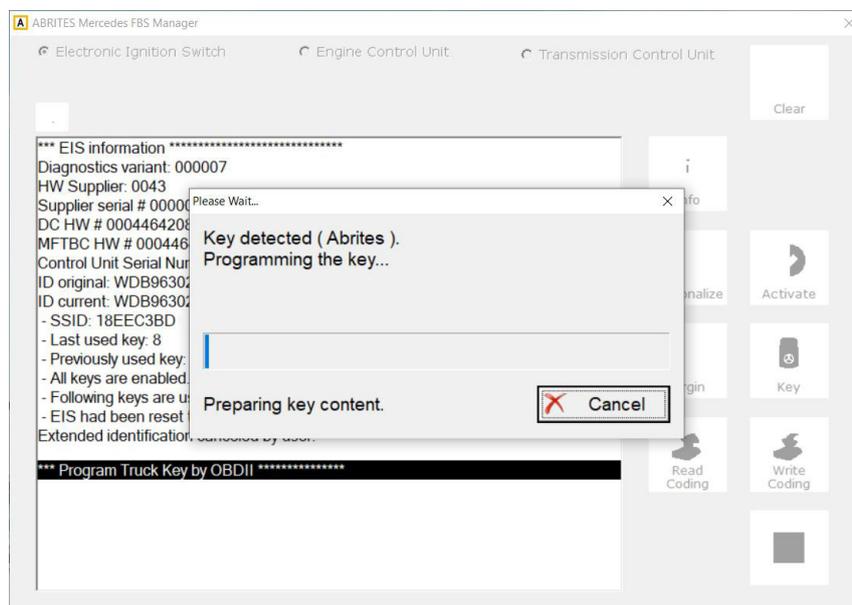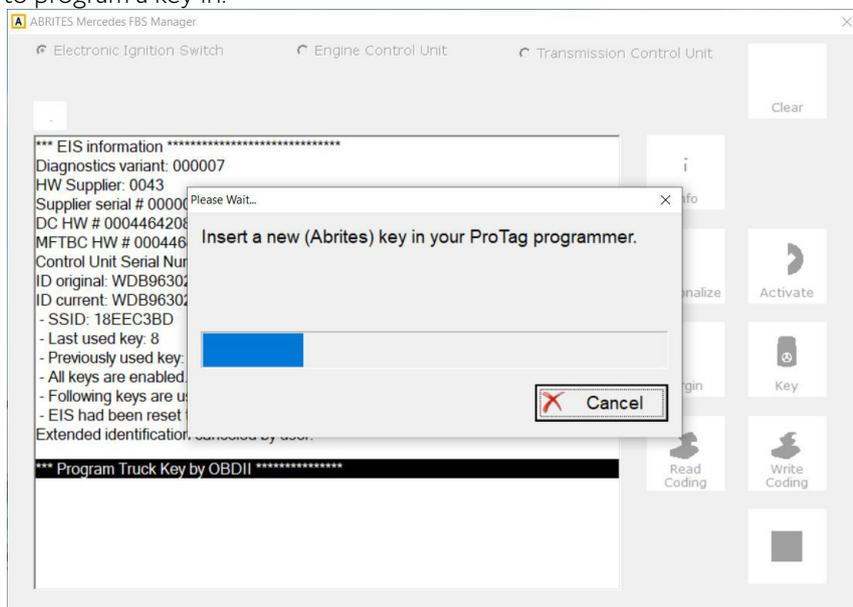
6. Module replacement

As with the DAS manager for cars, we provide a similar solution for trucks. When replacing the EIS/EZS, the first step is always to read and extract the password from the ignition switch. The difference here is that the FBS data is saved automatically when you program a key or press the virgin button. The location of the FBS data is:

- LOG Folder
- Installation Directory

The EIS/EZS is the main module in trucks, just like in cars. Therefore, if you plan to replace the EIS/EZS module in your truck, you will need to adapt all other DAS modules to it. If the donor module comes with a key, you will need to use that key for password extraction and starting the truck. If not, you can use the TA69 key.

The modules are adapted using two files: the FBS data file with the password already extracted, and the coding file. These files are written to virgin donor modules.

6.1 FBS Data

The FBS data file contains key and authorization information, similar to an IMMO file. A Mercedes truck requires the FBS data to function properly, but if it's missing, there will be multiple DTCs (Diagnostic Trouble Codes). To write the FBS data to a virgin donor module, the "Personalize" button is used. It's important to ensure that the donor module is in a virgin state before proceeding with the FBS data writing process.

6.2 Coding and VIN exchange

Coding is a file that contains secondary information about the truck, including its Vehicle Identification Number (VIN). It is required for the seamless integration of DAS modules in a Mercedes truck. When you replace a module, the VIN number needs to be changed and the VIN is contained in the coding for each module. The coding is not saved automatically, so you need to save it to a location of your choice. When you are changing a module, it is crucial to try and save the coding from the module you are replacing before making it virgin. Doing this will save you a lot of time during the replacement process. In most cases, the coding can be read and saved even from a defective module. However, if the module has been damaged by water, for example, it is more likely that you will need to perform manual coding. Coding reading and writing are performed using the corresponding buttons in the software.

6.3 SSID

To adapt a module to a Mercedes truck, you need to make it virgin first, which requires a service password that is automatically calculated when you press the "Virgin" button. After that, you can personalize it using the FBS data from either the replacement module (ECU-ECU or TCU-TCU) or the EIS/EZS.

The final step in exchanging any DAS unit is to press the "Activate" button, which confirms to the vehicle that the operations you have performed need to be saved.

6.4 Specifics

There are some specifics you need to be aware of:

- TCUs and ECUs cannot be personalized on a bench because they need sensors for the handbrake and neutral shifter position to be present. Please make sure to personalize them in the truck you are working on.
- When writing the coding of the truck, you will see a window for the VIN number. Please write the needed VIN (the one from the recipient truck) in this window and save it. Make sure to enter 17 digits there.
- Always remember this sequence when working on module adaptation – VIRGIN - PERSONALIZE - ACTIVATE. This is the sequence you need to follow.
- Coding is written when the module is personalized and not activated. Remember, activation is the last step of the process.