MICROTRONIK

HEXPROG II

TUNER

USER MANUAL

ECU & TCU PROGRAMMING SOLUTION





SUPPORTS MULTIPLE VEHICLES

ECU & TCU PROGRAMMING

CLONING & BACKUP

USER-FRIENDLY SOFTWARE

VERSION 1.1

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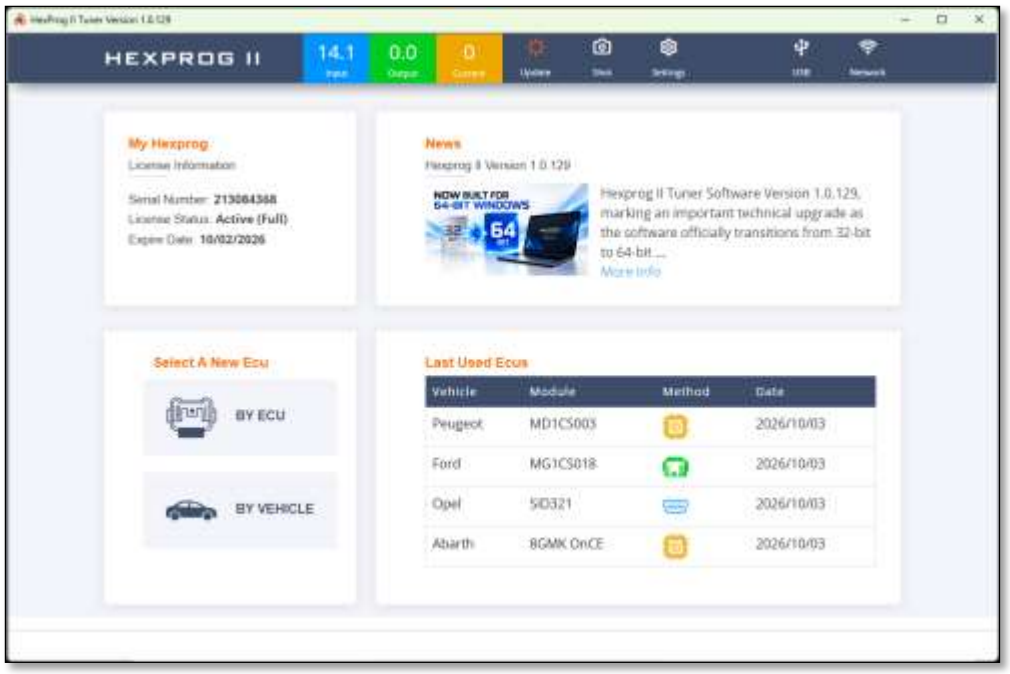
Revision history

Rev	Date	Description
v1.0	7/18/2023	
Modifications:	Release of original HexProg II user manual v1.0	
v1.1	10/3/2026	
Modifications:	2.8 VFI adapter hardware added 7.6 MD1-MG1 ECU unlocking New VFI method for unlocking Mgd1 ECUs added to the revised user manual	

1. General

The ECU/TCU is the electronic control unit responsible for managing various operations in modern automobiles. It handles tasks such as calculating and storing data for functions like air-fuel ratio and valve controls, ensuring efficient performance of the engine and transmission.

In addition, the ECU and TCU store unique security data specific to each vehicle, which imposes restrictions on replacing them with secondhand units via simple plug and play. Cloning plays a crucial role in enabling car programmers and ECU technicians to easily replace their control units with used ones from different vehicles. Essentially, cloning involves copying all data from one ECU to another, enabling it to function on a different chassis.



HexProg II is a professional tool for chip tuning, ECU cloning, and programming tasks. With its cutting-edge hardware and advanced software, HexProg II enables ECU technicians to read any complex ECM quickly and securely.

Designed with meticulous attention to detail and built upon extensive experience, HexProg II Tuner delivers unparalleled speed, reliability, and user-friendliness. It stands as one of the top solutions capable of reading the most challenging ECUs, supporting a wide range of ECUs/TCUs across various brands. Key features of HexProg II Tuner software include:

- Supports more than 15000 cars, bikes, trucks and tractors.
- Periodic updates to add more ECU protocols to the supported list.
- User-friendly software interface
- Auto checksum after modifications
- Cloning license lease options
- Active tech support availability
- ECU List: View the complete list of supported ECUs and TCUs, including vehicle applications and supported protocols. View the ECU List

2. Accessories Included

2.1 HexProg II



HexProg II - the all-in-one solution for your ECU needs. With HexProg II Tuner, you have the essential functions required for your daily job, from ECU repairs to reading IMMO information and chip tuning. It supports over 70 car brands and boasts an extensive ECU coverage of more than 15,000 vehicles. HexProg II Tuner's user-friendly software interface and automatic checksum feature make it the reliable choice for ECU repair and maintenance shops worldwide.

2.2 OBD Cable

A specially designed OBD cable that connects HexProg II to the car's OBD port, allowing OBD functions with ease.



2.3 USB Cable

High-speed noise-shielded USB cables are included for accurate and faster data transfer between the personal computer and HexProg II.



2.4 Bench Cable Set

Contains 4 sets of cables that can be used to communicate and read/write ECU Bench Mode and Boot Mode. Cable sets include CAN BUS wires, signal set wires, ground wires, and power wires



2.5 MPCxx / BDM Cable

The MPCxx Cable Set enables Boot Mode reading and writing of supported MPCxx based ECUs using HexProg II. It includes a dedicated ribbon cable compatible with BDM frames, a multi-colored wire cable for direct soldering to the ECU PCB.

2.6 JTAG / BDM Cable

The JTAG / BDM Cable is primarily used for automotive and truck ECUs that require Boot Mode access. It supports compatible MPC5XXX and SH72XX processors and features a rainbow-colored ribbon cable for connecting to the ECU PCB through the BDM method.



2.7 Power Supply

HexProg II bench functions require a 14V 3A AC/DC adapter as a power supply to provide power to ECUs. A custom-built power supply is provided with the tool.



2.8 VFI Adapter

HexProg II supports unlocking modern TriCore MG1 and MD1 ECUs using the Voltage Fault Injection (VFI) method. A dedicated VFI adapter is included with the HexProg II package and is required to perform the VFI procedure. The adapter enables communication with supported ECUs in boot mode for reading, writing, and patching operations.



Accessory quick reference

Accessory	Used for	Mode
OBD cable	Connecting HexProg II to the vehicle OBD port (DLC)	OBD
USB cable	Data transfer between the PC and HexProg II	All modes
Bench cable set	CAN BUS, signal, ground and power wires for ECU read/write	Bench and Boot
MPCxx / BDM cable	Reading MPCxx ECUs; ribbon cable for BDM frames, or solder to the PCB	Boot
JTAG / BDM cable	Car and truck ECUs; required for MPC5XXX and SH72XX ECUs	Boot
Power supply (14V 3A AC/DC)	Powering the ECU for bench functions	Bench and Boot
VFI adapter	Voltage Fault Injection unlocking of TriCore MG1 / MD1 ECUs	Boot (initial unlock)

3. Technical Specifications

HexProg II has the major advantage of the latest technology available which will make possible coverage of more ECUs than its previous versions. The major internal technical features of HexProg II are as follows.

- Uses one of the fastest modern ARM MCUs on the market, which improves performance and prolongs the life cycle of HexProg II.
- It supports cars, bikes, trucks, and tractors for repair, cloning and chip tuning.
- HexProg II covers all standard automotive communication protocols, including ISO 15765, ISO 14229, ISO 14230, ISO 9141, SAE J2178, SAE J2284, CAN FD (ISO 11898-1 / ISO 11898-2), and others required to communicate with cars, trucks, and other vehicles. **CAN FD** is natively supported on both CAN channels of HexProg II, providing **CAN FD** communication for **OBD**, **Bench**, and **Boot** operations.
- It supports all known requirements to provide the ability to program major available Microcontrollers in vehicles (Like Infineon, Renesas, Freescale/Motorola, NEC, …)

4. Software Configuration Requirements

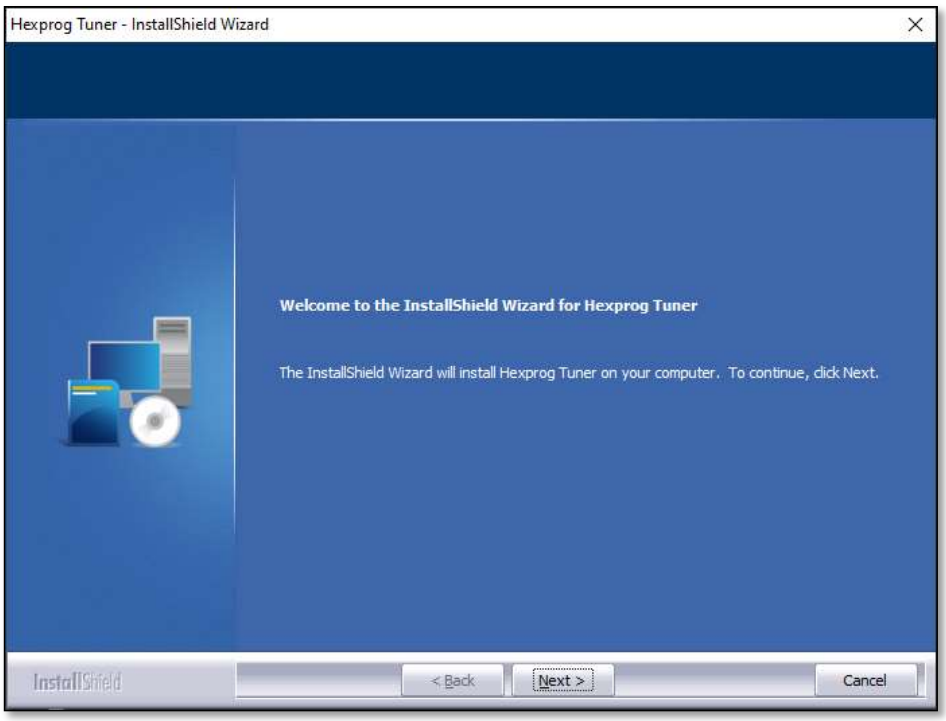
HexProg II Tuner software can be used on Windows 10 and later operating systems, both in 32-bit and 64-bit versions. To install the software and make it work properly, you need to have an internet connection. This is because the software relies on connecting to Microtronik servers to access important data during its operation.

5. Software Installation and Configuration Files

HexProg II Tuner software can be installed from the Microtronik official website. If you download the software for checking purposes without HexProg II hardware, you can only view the software's layout and the list of supported ECUs and vehicles. So please follow the given procedure to download the software and set it up.

1. Download HexProg II Tuner software from the web address https://www.microtronik.com/support/downloads

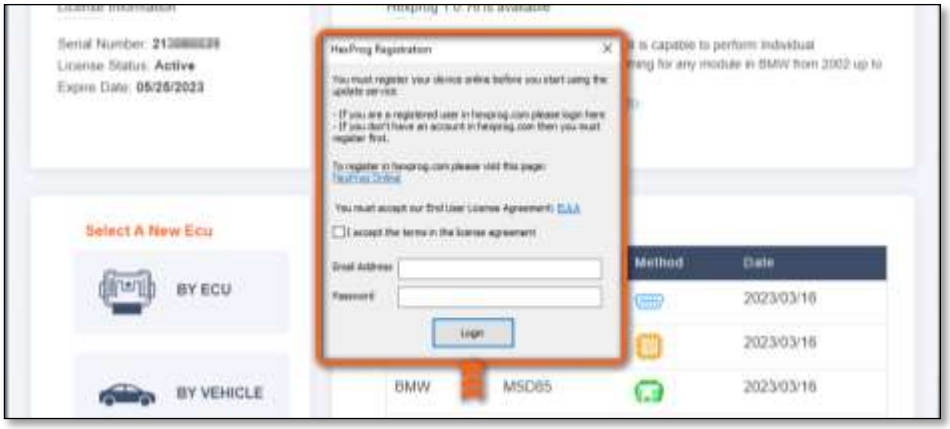
2. Once the download is finished extract the software and install it to the PC



3. Connect HexProg II hardware to one of the USB ports of the PC
4. Click the update button on top of the software

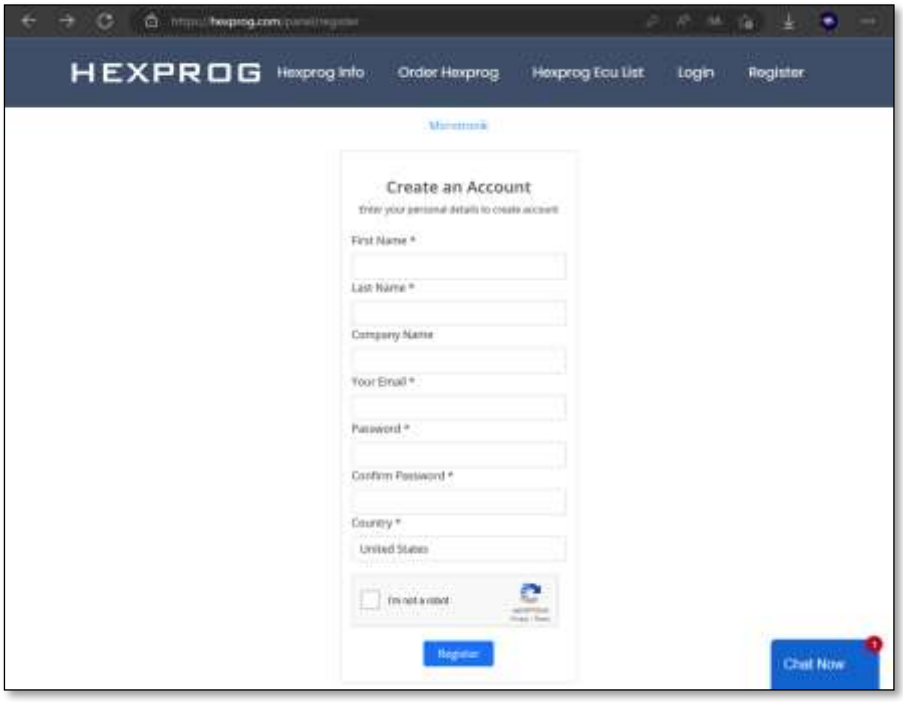


5. Then the software will show you a login window.



6. Please go to www.hexprog.com and register your e-mail and fill up your details
7. Do not use special characters in the password when you register.

8. Go to your e-mail and activate account from the link given in the e-mail



9. Then come back to HexProg II Tuner software and fill up the e-mail and password created on www.hexprog.com
10. Software will start updating now and once the update is finished software can be used.

Note: Software downloads and support are available at www.microtronik.com. Account registration, online services, license leasing, and technical support are available at www.hexprog.com.

6. Operation Manual

Once the software update is completed it will display the home page given above.



6.1 Home Button

HexProg II logo in the toolbar acts as the home button. Regardless of your current page or ECU selection, you can click on it to quickly return to the main menu or home page

6.2 Voltage and Current Tracking

Live voltage and current tracking are given on the top of the software. It will help users to identify the communication and the required power supply to ECU and the current draws.



6.3 Update

The update button is given on the home page in between the voltage/current display and the screenshot button. HexProg II Tuner software has a convenient update button on its home page. This button turns orange when a new version is released. Users can simply click the update button to install the latest version, which brings new features and supports additional ECUs.



6.4 Screenshot

The toolbar also has a special button for capturing live screen photos. It's a useful feature that allows customers to take screenshots of software screens for various purposes.

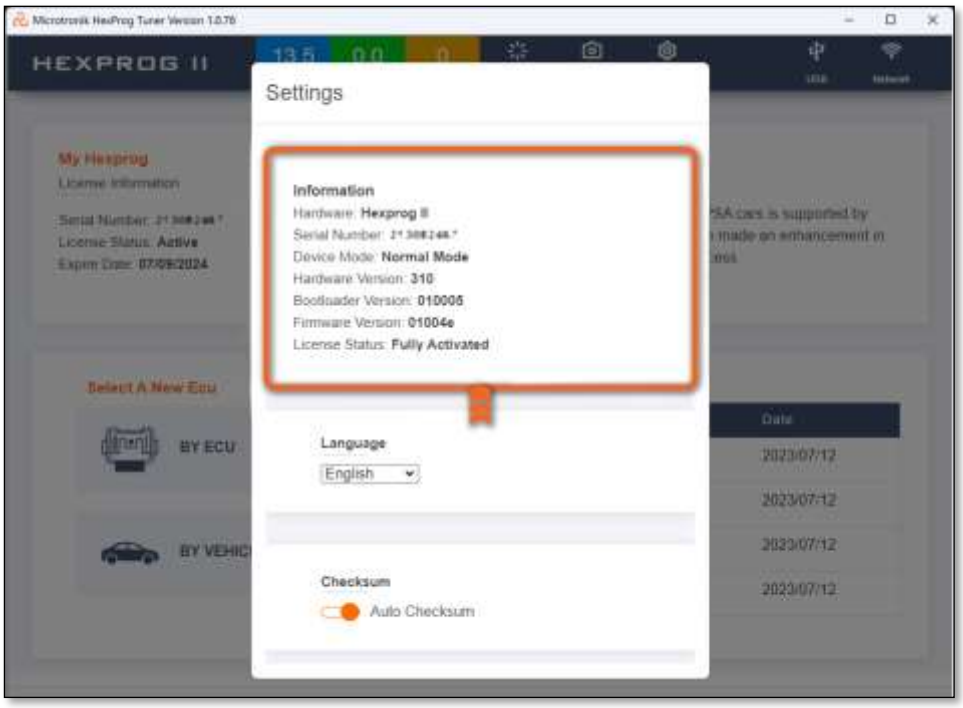


6.5 Settings

The toolbar provides users with the option to modify their preferences, such as language and checksum settings. Just simply click on the "Settings" button conveniently located on the toolbar. Additionally, it also displays essential information about your device.

6.5.1 Serial Number and License

The software features a "Settings" button, which displays your hardware version, device status, and serial number. Upon closing the settings window and returning to the main menu, you will find concise information about your license status and expiration date.



6.5.2 Languages

The default language of the system is English. It also supports French, German, Spanish, Portuguese, Chinese, Korean, and Turkish. Users have the flexibility to choose their preferred language and set it as the default, enabling them to interact with the system more comfortably and effectively in their chosen language.



6.5.3 Checksum

One of the useful features of HexProg II Tuner is its ability to perform checksums that works with most supported ECUs. It allows tuners to modify the ECU's flash or MAPs section and write it back without any hassle. The software offers an auto checksum option, which can be activated or deactivated from the user interface. This feature simplifies the process of writing original flash files to the ECU separately, with or without checksum correction.



6.6 USB and Internet Status

When the device is working and connected to the internet, both the USB and internet connection are active. If any of them become disconnected or encounter connectivity issues, the software will indicate their status as inactive.





6.7 Selection of ECU/TCU

The ECU/TCU selection process offers two options: choosing based on the vehicle model or direct selection. This streamlines operations, allowing faster read/write and cloning of ECUs without complications. Additionally, a window displays previously used ECUs for easy selection, simplifying the process further. In summary, users have multiple search methods available to find and select ECUs efficiently.



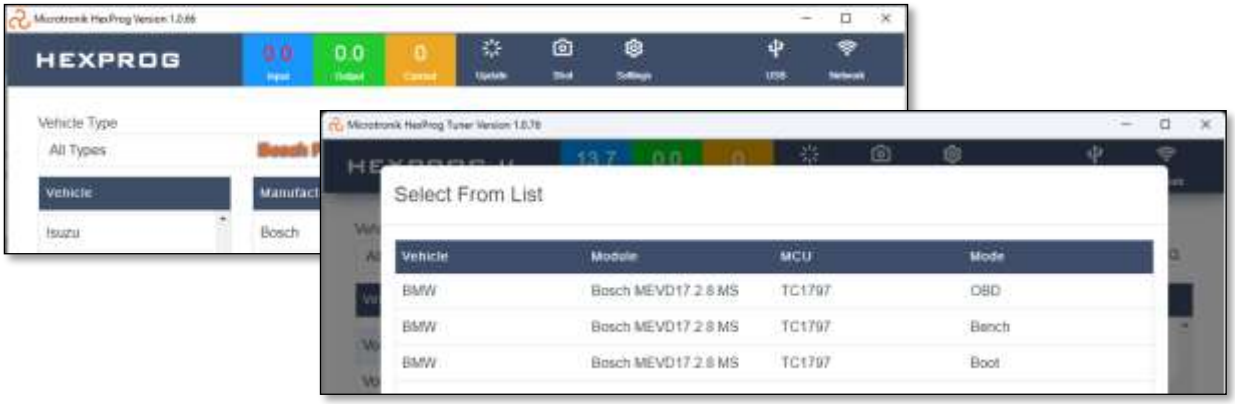
- Using car model
- Using engine type
- Using ECU name/Bosch part number

6.7.1 Selection by ECU



HexProg II Tuner software offers convenient ECU search options by part number and ECU name, facilitating easy browsing by list or car.

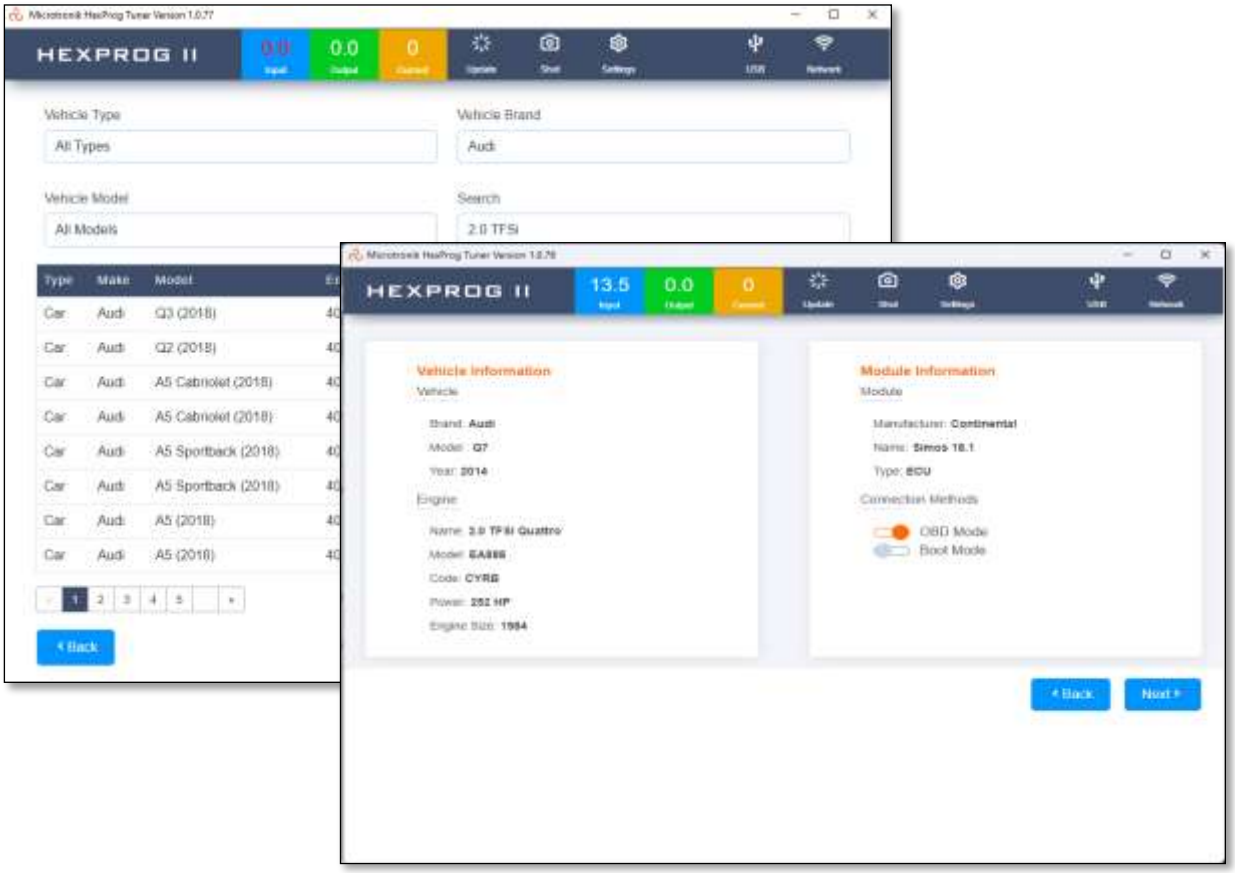
This is especially useful for Bosch ECUs without labeled names, but only part numbers. The software also allows manual selection of specific ECUs from manufacturers, providing flexibility in tuning.



6.7.2 Selection by Vehicle Model

The ability to select ECUs based on vehicle models is beneficial for users who are knowledgeable about vehicles but may not be familiar with specific ECU names. This feature simplifies OBD read/write functions and enables users to conveniently search for their car model or engine code directly.

After selecting a vehicle, users will be directed to a page displaying all pertinent details such as the model, engine type, and year of manufacture. This allows users to verify that the information matches their own car model. Once they have confirmed the accuracy of the details, they can proceed to the ECU/TCU read/write option.



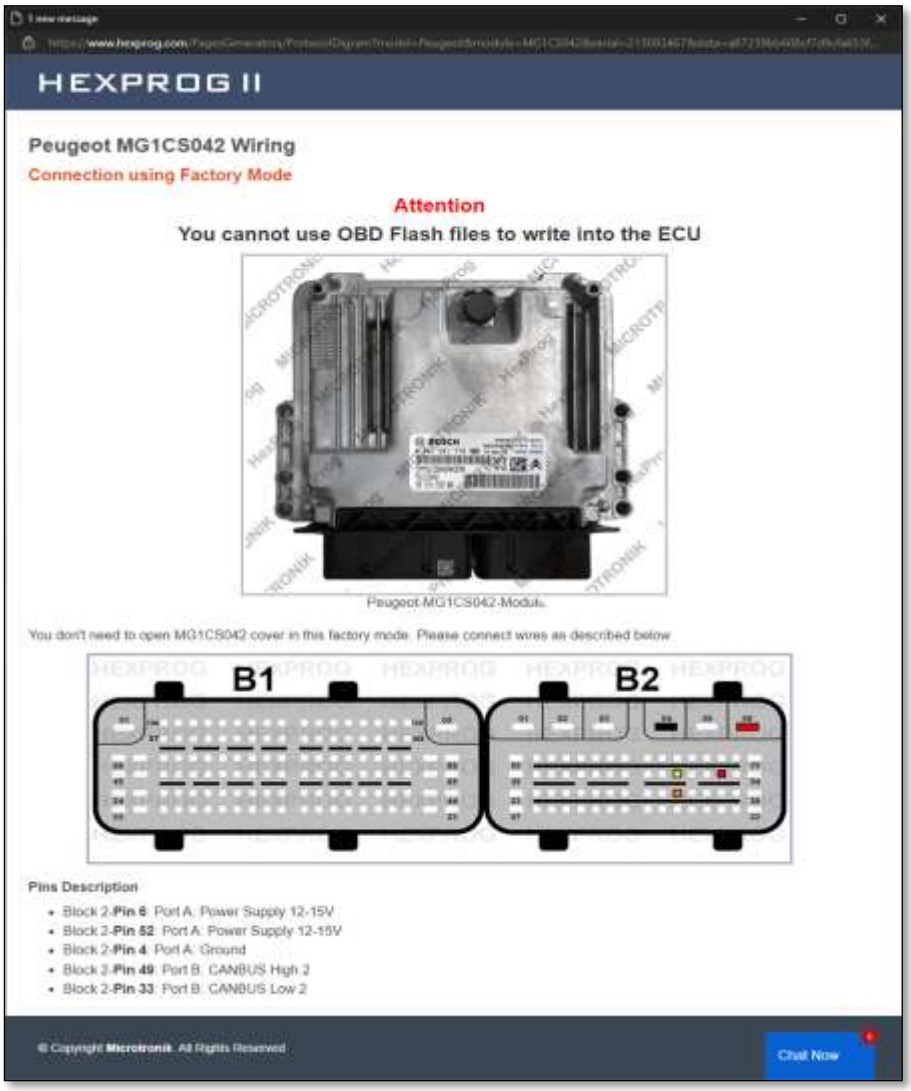
6.7.3 Last Used ECUs/TCUs



We have implemented a new feature that allows users to browse through the history of previous ECUs/TCUs that have been worked on. This feature is designed to assist users in identifying and reviewing past ECUs/TCUs, providing them with the exact date of when the work was done

6.8 Wiring diagrams

Once you choose the ECU/TCU, you'll have various options to read or write ECU/TCU data, along with a wiring diagram option. Easy-to-understand and detailed wiring diagrams make things simpler for users. However, wiring diagrams are not provided for OBD Mode since they are only necessary for Bench and Boot Modes, where you need to connect wires to the ECU/TCU. In OBD Mode, you can simply



connect the DLC coupler using an OBD cable.

7. Operation Modes

7.1 Different Modes for ECUs/TCUs

HexProg II Tuner has three modes for reading ECUs/TCUs:

- Bench Mode
- OBD Mode
- Boot Mode

Most ECUs can be accessed in any of these modes, each with its own advantages and performance benefits. However, some ECUs/TCUs are only supported in specific modes. On the ECU/TCU read/write menu, symbols show which mode is available for each ECU/TCU. If a mode is not supported for a particular ECU/TCU, a message will appear when you hover over the corresponding button, indicating that the connection method is not yet available. The supported buttons will show an active protocol.

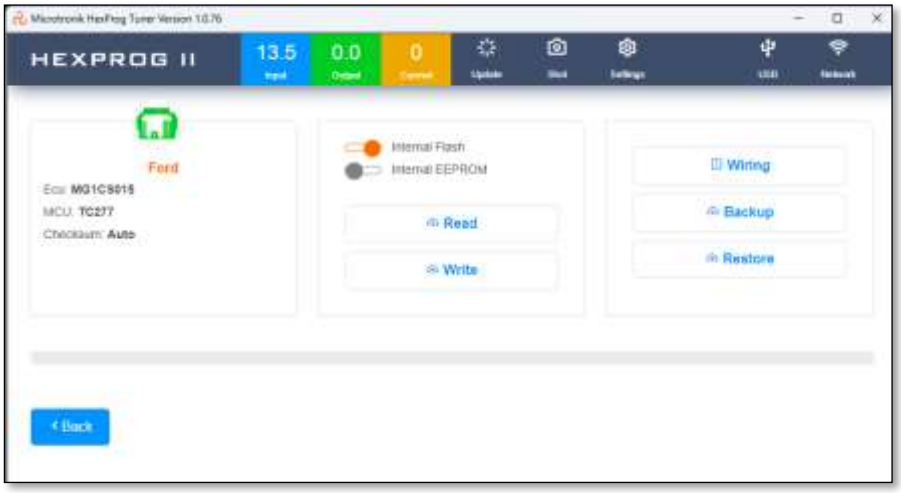


Comparison of operation modes

Mode	ECU cover opened?	Wiring diagram	Typical use
Bench	No	Yes, wires connected to the ECU connector	Read and clone/repair ECUs/TCUs outside the vehicle
OBD	No (ECU stays in the vehicle)	Not needed, use the OBD cable on the DLC	Read/write, tuning, filter, restoring stock maps
Boot	Yes, direct connection to the PCB	Yes	When communication via Bench Mode is lost; required for some ECUs

7.1.1 Bench Mode

Bench Mode in HexProg II Tuner allows users to read and clone/repair ECUs/TCUs without opening their covers. By connecting wires and a power supply to the ECU/TCU, users can easily



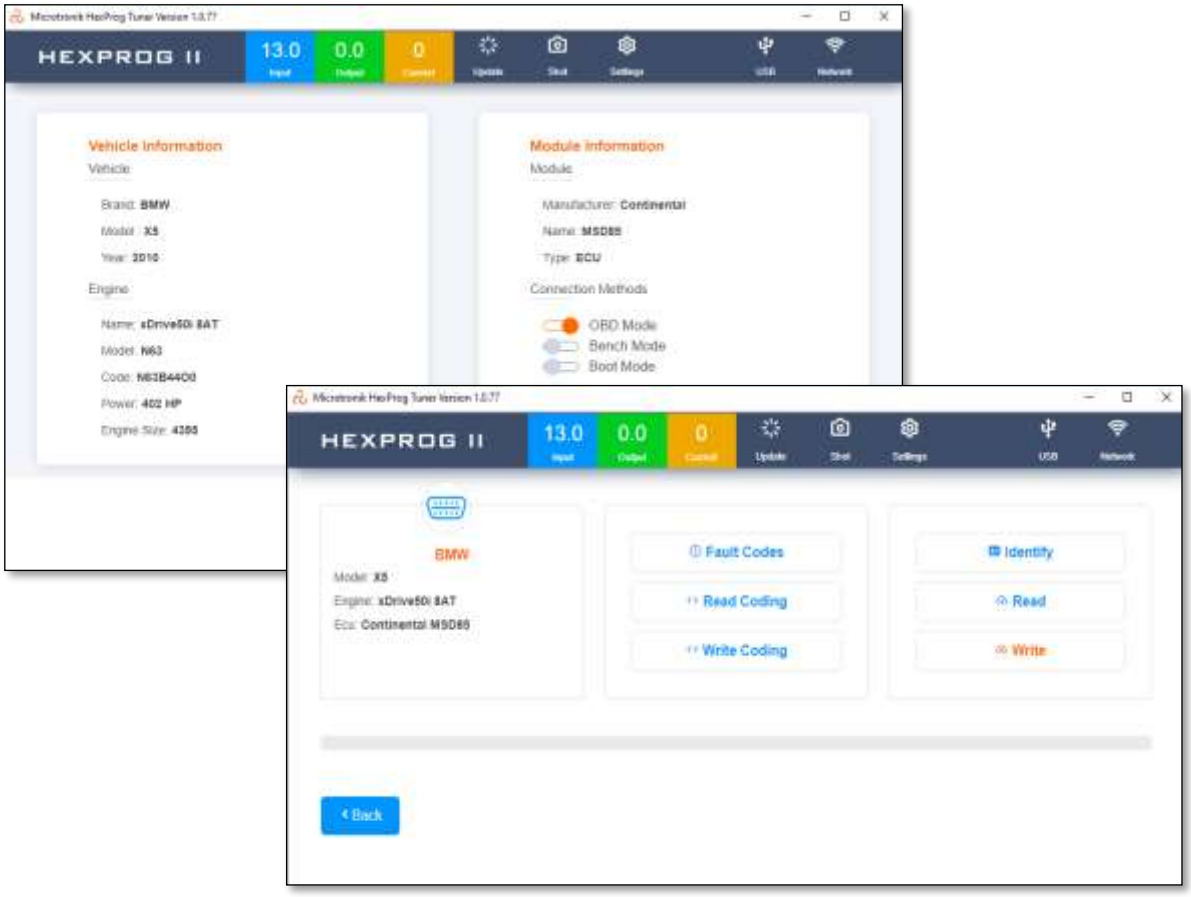
read and transfer data to another ECU/TCU, making it a reliable and convenient method for ECU tasks.

- Plug wires to ECU connector according to the wiring diagram.
- No need to open ECUs.

7.1.2 OBD Mode

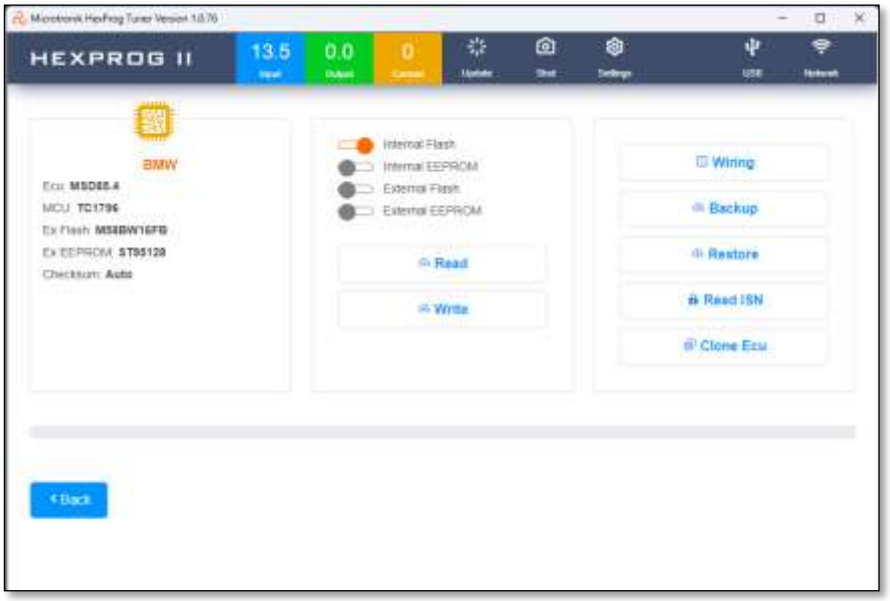
This enables users to read and write data on ECU/TCU without removing it from the vehicle. It offers features such as power boosting, disabling filters, and bypassing immobilizer functions. Additionally, it can repair ECU maps by overwriting them with original stock files obtained from the server. The ECU read/write process is performed using the provided OBD cable.

- Read and Virtual read based on ECU part number.
- Direct OBD method without removing the ECU.
- Auto checksum correction.
- Suitable for ECU Tuning and other online services.



7.1.3 Boot Mode

Boot Mode is a method used for reading and writing data in certain ECUs. It requires opening the ECU cover and making direct connections to the PCB board. This method is useful when communication is lost via Bench Mode. With HexProg II software and a provided wiring diagram, you can establish connections and perform ECU data operations similar to Bench Mode.



7.2 Backup and Restore Options

HexProg II Tuner offers comprehensive support for ECU/TCU cloning in both Bench Mode and Boot Mode. It is compatible with a wide array of ECUs/TCUs and ensures accurate replication, particularly for models without an immobilizer in the OTP portion. By capturing and encrypting all data, including internal flash, EEPROM, and external memory, it generates a .bak file. This versatile backup file can be effortlessly utilized to clone the ECU onto a donor ECU, simplifying the cloning process significantly.

7.3 Clone Button

Some ECUs can be cloned 1:1 by backing up the original ECU and donor ECU, then restoring the backup to the donor ECU without overwriting TriCore password in the OTP portion. However, other ECUs require special protection for password cloning. HexProg II Tuner offers a clone button specifically for these ECUs to ensure secure cloning without altering the TriCore password in the flash. It's crucial to create backups of both ECUs before starting the cloning process. By connecting the original ECU, clicking the clone button, and then connecting the donor ECU, HexProg II Tuner transfers the data without changing the password. Failure to follow these steps may result in changed passwords and issues with the ECU. If the original file and PC used with the ECU are available, it is possible to recover the ECU by restoring the original file in Boot Mode using the same PC, which restores the password stored in the internal flash.

WARNING: Back up both the original ECU and the donor ECU before cloning. Not following the clone steps in order (original ECU, clone button, then donor ECU) may change the TriCore password and cause problems with the ECU.

Note: *It is always recommended to make all ECU backups before modifying or cloning ECU for future ECU recovery and safety purposes.*

7.4 Reading ECU Data Individually

The advanced option in HexProg II Tuner allows you to read/write ECU data in a more targeted manner. Instead of creating a full back up, you can read individual data files in the ECM, such as the internal EEPROM, internal flash, or Ext-flash. This feature is particularly useful for cloning when certain data in the original ECU, like the VIN or IMMO, is corrupted in the internal EEPROM, and different data is present in the internal flash.

By copying the specific data from one ECU to another, you can address issues caused by corrupted internal flash. Additionally, if the original ECU's internal flash has been corrupted during flashing/programming or due to other factors, you can recover it by writing a good flash to the ECU. However, the success of 100% cloning through individual data writing may depend on the extent of data damage and the specific memory locations storing the data.



7.5 ISN Reading-ECU Info

One of the characteristic features of HexProg II Tuner software is that it can read the Immobilizer security key known as ISN number from BMW and MINI ECU using Bench Mode. This software also displays the VIN (Vehicle Identification Number) stored within the ECU



during the ISN reading process. Additionally, ISN can be read in Boot Mode, and a convenient ECU info button is provided for this purpose.

7.6 MD1-MG1 ECU Unlocking

HexProg II provides advanced support for permanently unlocking secured TriCore MG1 and MD1 ECUs using the Voltage Fault Injection (VFI) method. This enables supported ECUs protected by manufacturer security or standard read/write restrictions to be unlocked for ECU reading and writing.



Supported TriCore 2xx MCUs can be unlocked and patched in boot mode using the VFI method. Once successfully patched, the ECU remains permanently unlocked, allowing normal bench-mode reading and writing without being identified as a secured ECU. After the initial VFI unlocking procedure, there is no need to reopen the ECU for subsequent bench-mode operations.

BMW MGD1 ECUs

For supported BMW MGD1 ECUs, HexProg II Tuner provides a direct bench-mode solution for both secured and non-secured ECUs. No VFI unlocking procedure is required.

Simply select the appropriate BMW MGD1 ECU in the Tuner software, connect the ECU in bench mode, and perform the read operation. Supported secured BMW MGD1 ECUs can be read and written directly in bench mode without performing a VFI procedure.

Important:

BMW secured MGD1 ECUs: Can be read and written directly in bench mode using HexProg II Tuner, without VFI unlocking.

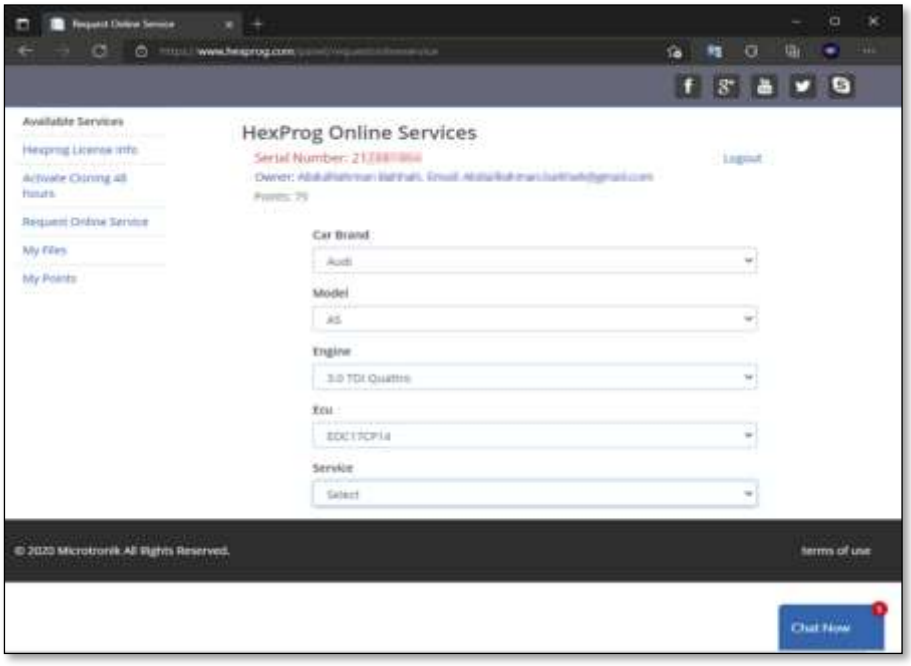
Other-brand secured MG1/MD1 ECUs: Require the VFI unlocking procedure before they can be read and written in bench mode.

After VFI unlocking: The ECU can be read and written in bench mode without reopening the ECU cover for subsequent operations.

Non-secured MGD1 ECUs: Can be read and written directly in bench mode without any unlocking procedure.

8. Other Services

8.1 Online Service



We offer a wide range of specialized ECU software services, available online through your account at www.hexprog.com.

- **Points-Based System** – Flexible access to online services.
- **Fast Processing** – Quick service with no waiting.
- **Tested and Reliable** – Verified on vehicles for dependable performance.

8.2 Short-Term Activation of Cloning License

For the tuners and garages who infrequently use the Clone or Tune function and find that a one-year license is not financially feasible, we offer the option to purchase a license with full functionality for a 48-hour period. This allows them to complete their necessary tasks within a shorter timeframe while keeping costs more manageable.

- Cloning license can be easily leased for 48 hours from our website online and its instant activation from www.hexprog.com
- It's based on a points system with affordable charges.

- No usage restrictions or limits on the number of ECU during the active license period.



9. Active Tech Support

We provide comprehensive online tech support exclusively for our customers. Our dedicated team is available to help you become familiar with the functions and capabilities of our tools. If you have any doubts or questions, our online team is ready to assist you in real time. We have made it incredibly convenient to access support through our website, where you can easily chat with us for immediate clarification while you work. Additionally, we offer online support across multiple platforms. These IDs are available in the contact section on www.microtronik.com/contact

- Microsoft Teams
- WhatsApp
- Live chat from the website
- Ticketing facility from the website
- Email support

Thank you for choosing HexProg II Tuner as your cloning and ECU solution. We are happy to welcome you to our family. Please reach us if you have any queries…

10. Glossary

Term	Meaning
ECU / TCU	Electronic Control Unit / Transmission Control Unit.
IMMO	Immobilizer, the vehicle anti-theft system whose security data is stored in the ECU.
ISN	Immobilizer security key number that HexProg II can read from BMW and MINI ECUs.
VIN	Vehicle Identification Number, also stored in the ECU.
OTP	One-time programmable memory area of the ECU; some ECUs keep security data here.
Flash / EEPROM	ECU memory types that can be read and written individually (internal flash, internal EEPROM, external flash).
Checksum	A value used to verify data integrity; it must be corrected after modifying flash or map data.
BDM / JTAG	Debug interfaces used to connect to the ECU PCB in Boot Mode.
VFI	Voltage Fault Injection, the method used to unlock secured TriCore MG1 and MD1 ECUs.
DLC	Data Link Connector, the vehicle OBD diagnostic socket.
CAN BUS	Controller Area Network used by vehicle control units to communicate.
Bench / OBD / Boot Mode	The three connection methods described in section 7.1.