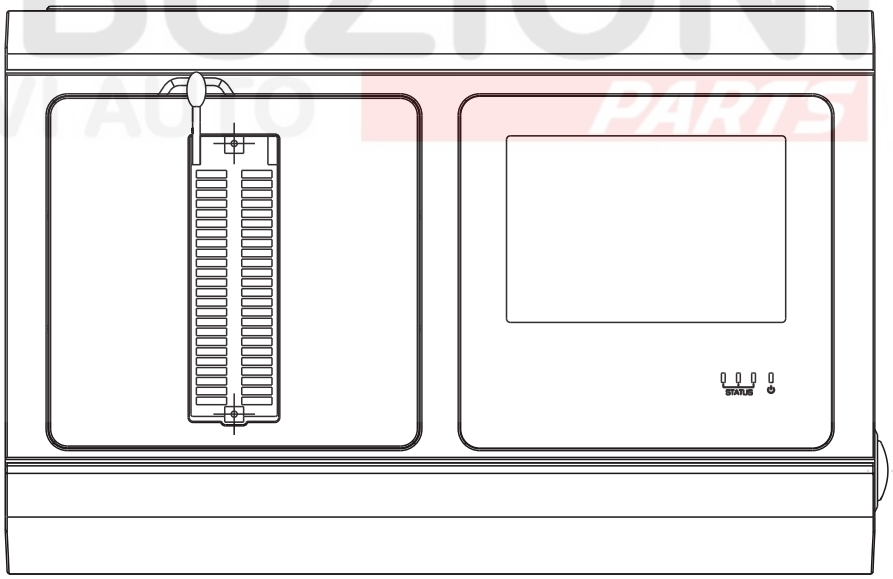
Xhorse®

Multi-PROG

Exreme Programmer

User Manual



QUADRIFOGLIO DISTRIBUZIONI
DIVISIONE CHIAVI AUTO PARTS



E X T R E M E

H O R S E P O W E R

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1 Documentation Statement

Dear users, thank you for choosing the Xhorse brand Multi-PROG device. To assist you in the better use of the device, please read this manual carefully and strictly observe the following statements before use:

- This device is intended to be used only for reading and writing chip and module data in a legal environment. Please comply with national laws and do not use the device for illegal purposes.
- Xhorse company is not responsible for any direct, indirect and incidental damages or any consequential economic damages.

2 Safety Precautions

In order to avoid causing personal injury and damage to equipment and vehicles, etc., please read the manual carefully before operation and observe the following safety precautions:

- Please use the equipment in an environment with good electromagnetic ;
- Please wear goggles that comply with ANSI standards;
- Do not connect to a power supply that does not comply with specifications;
- Disconnect the power supply when the equipment is not used or serviced for a long time;
- Do not place the equipment in a humid, greasy, dusty or other harsh environment;
- Do not press, drop or expose the equipment to the sun;
- Keep the equipment out of the reach of children;

3 Product List

The package of the whole product covers the following items, if there is any missing item, please contact your dealer or add this skype account: live:.cid.1c698c9c01ec2482, please refer to chapter 4 for details of accessories.

Item	Name	Quantity	Remark
1	Multi-PROG	1	Multi-PROG programmer
2	USB Cable	1	USB square port cable
3	Power Adapter (15V 4A)	1	Power adapte
4	220V Power Cord	1	220V AC input cable
5	VH13 Interface Adapter Board	1	Chip holder adapter
6	VH20 Interface Adapter Board	1	Interface self-test adapter
7	VH23 Interface Adapter Board	1	Chip Soldering Adapter
8	MCU Adapter Multi-PROG Solder Cable	1	MCU Read Soldering Cable
9	MCU DB15 Adapter Cable	1	MCU Read Solder-free Adaptor Cable
10	ECU Adapter Multi-PROG Solder Cable	1	ECU Read Soldering Cable
11	ECU DB15 Adapter Cable	1	ECU Read Solder-free Adaptor Cable
12	ECU Cable Plug	1	Suitable for different PIN sizes
13	Multi-PROG OBD Cable	1	Multi-PROG OBD Cable
14	USB WIFI Network Card	1	USB WIFI Network Card
15	Product Manual	1	Product Manual
16	Certificate Of Conformity	1	Factory inspection certificate and warranty certificate

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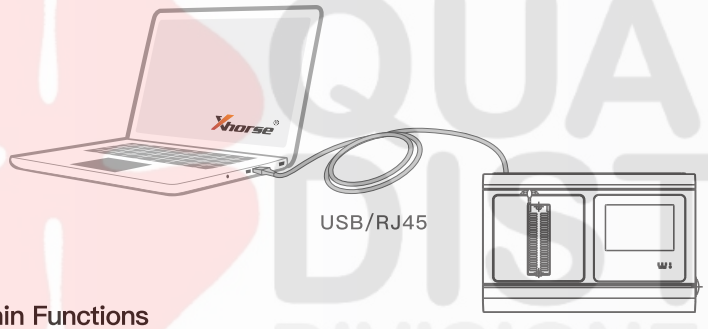
4 Product Functions Overview

Multi-PROG is especially designed for the automotive repair and automotive module programming by Shenzhen Xhorse Electronics Co., Ltd. The device supports the programming, reading, writing and cloning of common automotive MCUs, automotive memory chips, common electronic modules and automotive ECU computer boards.

4.1 Device Functions

4.1.1 Device Connection and How to Use

Multi-PROG programmer consists of 2 parts: the main unit and the PC software.
The main unit can be connected to the PC software through the wired network port RJ45 (interface 10) or USB port (interface 11).

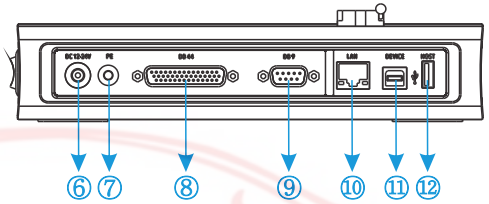


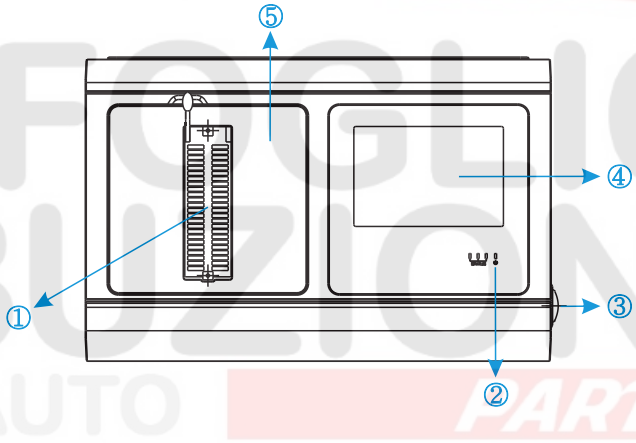
4.1.2 Main Functions

Memory read/write: support the reading/writing of common memory chips (see Chapter 5 for details).
MCU read/write: support for various brands of automotive MCU read/write (see Chapter 6 for details).
Automotive immo module read and write: support for common automotive immo module data read and write (see Chapter 7).
Engine ECU read/write: support a variety of automotive engine ECU computer data read/write operations (see Chapter 8), support for part of the ECU computer checksum data processing.
Gearbox TCU read/write: support many types of automobile gearbox TCU computer data read/write (see Chapter 9 for details).
Third-party script function: supports loading software scripts developed by the third party, and utilizes the script function to provide data processing and data modification.
The batch write function: Multi-PROG devices support the factory mode for batch write to chips. In this mode, it is possible to write chips in batch, offline write, file offline write, and other functions.

4.2 Device Interfaces and Accessories

4.2.1 Device Interface Description





① IC Locking Holder
Used for locking the chip holder to read chips.

② Status Indicator
Power indication and main unit working status indication.

③ Main unit switch

④ Touch screen

⑤ Magnetic shield
Magnetic design, can be quickly removed to replace other types of adapter board.

⑥ Power socket

⑦ PE grounding plug
(Grounding is required for specific environmental scenarios, and can be left vacant for non-specific environments.)

⑧ ISP/ECU/DOIP interface
Integrated chip program, ECU computer programinterface, while supporting the DOIP protocol interface.

⑨ Automation programming interface (reserved)

⑩ RJ45 network port (for connection to PC software)

⑪ USB A interface (for connection to PC software)

⑫ USB B interface (WIFI Network Card, U disk and other devices)

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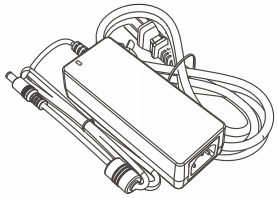
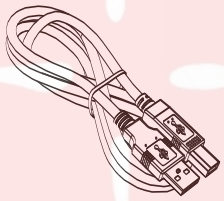
4.2.2 Introduction of device accessories

• Power Adapter (15V 4A)



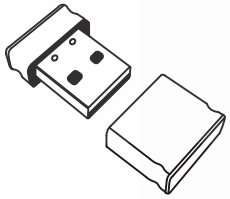
The power adapter is used to power the device.

• USB Connection Cable



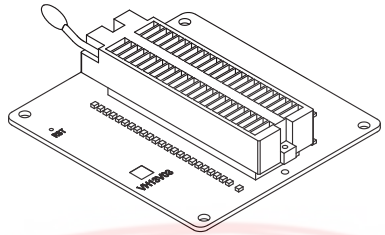
The USB connection cable is used to connect the device to PC.

• USB WIFI Network Card



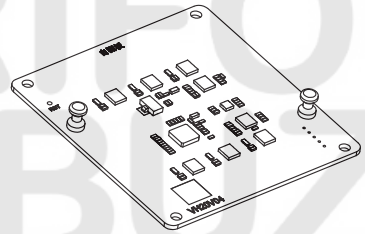
The USB Wi-Fi card is used for device networking and facilitates sharing of memory data.

• VH13 Interface Adapter Board



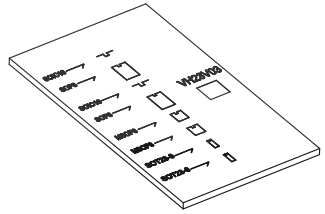
Chip holder adapter board. Use this adapter board to lock all kinds of IC holder and DIP sealed memory chips to facilitate chip reading and writing.

• VH20 Interface Adaptor Board



When you need to perform self-test and diagnosis on the device interface, you can take off the magnetic shield, remove the VH13 interface adapter board and insert the VH20 self-test board. Run the software help/ZIF48 self-test menu to complete the self-test.

• VH23 Interface Adapter Board



As shown in the above figure, the 6-pin, 8-pin and 16-pin chips are soldered on the adapter board which can be used to read and write the related chips.

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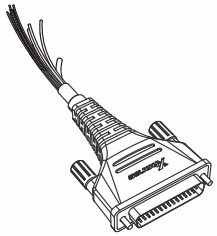
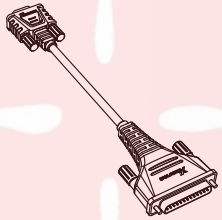
• MCU Adapter Multi-PROG Solder Cable



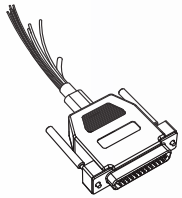
Plug the cable into the DB44 port of the device, read and write MCU chip data or automotive module data according to the wiring diagram.

• MCU DB15 Adapter Cable



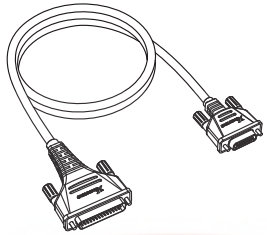
Plug this adapter cable into the DB44 port of the device, and then connect the corresponding solder free adapter board to read and write automotive module data.

• ECU Adapter Multi-PROG Solder Cable



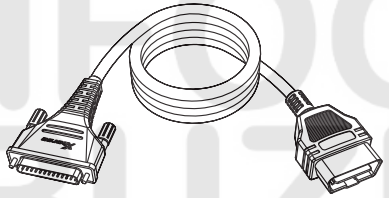
Plug the cable into the DB44 port of the device, read and write ECU module data according to the wiring diagram.

•ECU DB15 Adapter Cable



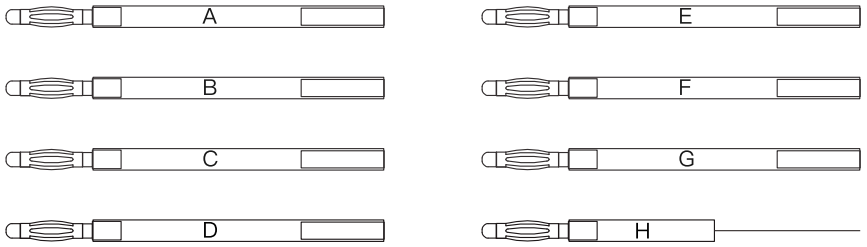
Plug this adapter cable into the DB44 port of the device, and then connect the corresponding solder free adapter board to read and write ECU module data.

•Multi-PROG OBD Cable



Plug the OBD cable into the OBD port of the car, and then select the corresponding model option on the software to read and write ECU and other module data directly through the OBD cable.

•ECU Cable Plug



In order to connect various different types of ECUs, the device has 8 different types of ECU cable plugs, and the corresponding plugs can be selected to connect the ECU pins.

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4.3 Multi-prog Hardware Parameters

Item	Specification
Operating System	Linux
Processor	ZYNQ7020 Dual Core Cortex A9 + FPGA
Memory	256M*2 DDR + 64M NOR FLASH
Display	3.5 inch, 320*480
Input Voltage	15V/4A
Working Current	300mA(14V)
Working Temperature	-20~55℃
Storage temperature	-30~65℃
External Interface	USB/RJ45
Dimension	L233*W150*H54mm

5 EEPROM Read/Write Operation

5.1 Introduction to EEPROM

EEPROM is a memory chip used to store various electronic information data of the vehicle. The storage capacity of the memory, ranges from a few hundred bytes to several hundred megabytes. The Multi-PROG programmer provides a variety of interface connection methods to read and write chips.

Run the software on the PC to enter the memory function menu, you can select the corresponding options by EEPROM manufacturer and specific model. At present, the device covers almost all the common types of EEPROM chips that can be used in automotive electronic modules. The device supports reading serial interface and parallel interface of various types of EEPROM (some parallel interface memory requires special adapters).

5.2 EEPROM Model and Mask Query

After entering the specific chip brand menu option, the Multi-PROG software will display all memory chip models under the brand that have been supported. As shown in Figure 5.2.1.

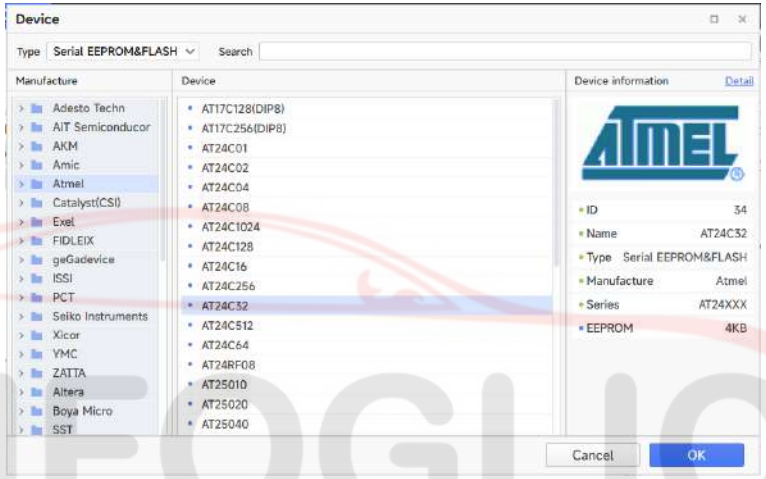

Figure 5.2.1

In addition to selecting by manufacturer brand, you can also directly enter the memory chip model or silk screen mask in the search box to search for the corresponding options, as shown in Figure 5.2.2. For example, if you directly input the silk screen mask '5BBD' of an 8-pin chip, the software will automatically display the corresponding chip model 95320 option.

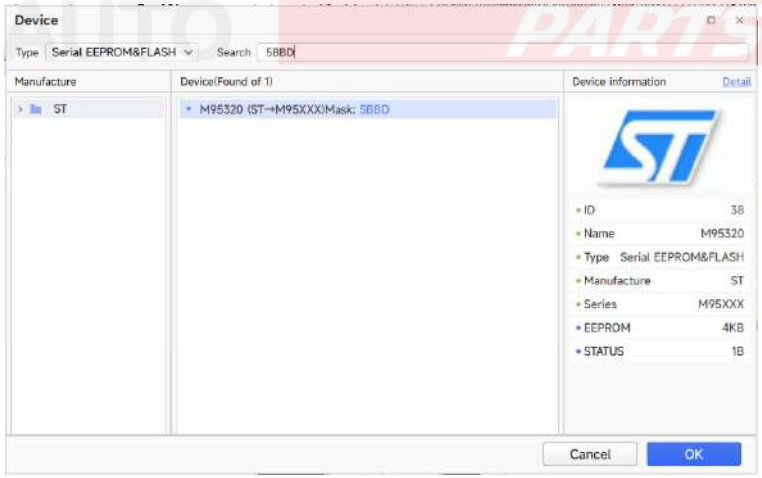

Figure 5.2.2

5.3 EEPROM Read/Write and Check

For EEPROM, the device provides read, erase, write and check functions. As shown in Figure 5.3.1, you can click the corresponding button directly on the interface. Please note that all chip data will be lost after erasing, and the original data of the chip will be erased automatically when clicking 'Write'.

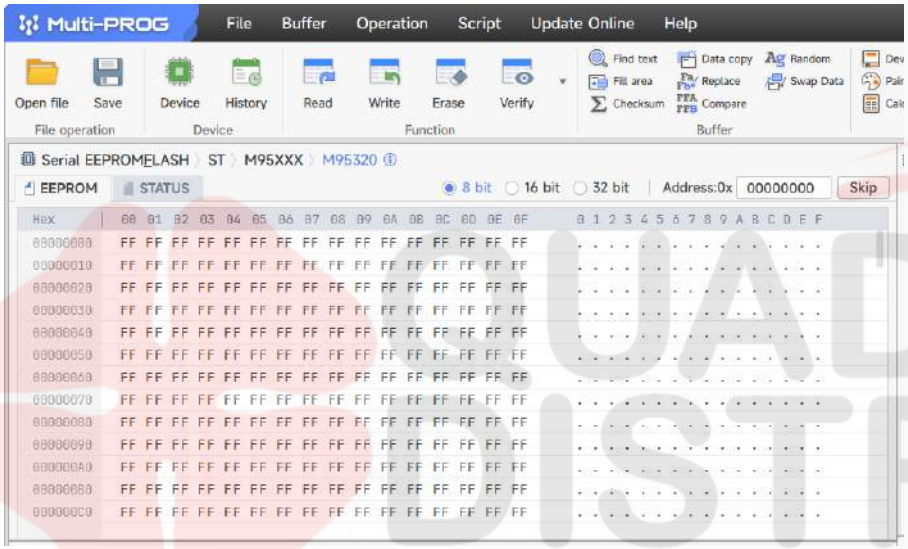

Figure 5.3.1

6 Microcontroller Read/Write Operation

The microcontroller function is mainly used for data reading and writing of various automotive electronic modules and automotive computer modules. It is especially suitable for automobile circuit module repair. Before using this function, you need to understand some principles and common knowledge of microcontroller.

Multi-PROG supports reading, writing, and programming various common brands of microcontrollers. Before data reading and writing, you should make the correct wiring connections according to the software wiring diagram corresponding to the brand, model, and microcontroller series. For some models, the microcontroller requires soldering minimum system circuit before reading.

6.1 Microcontroller Manufacturer Distinction

The device supports reading and writing microcontrollers from multiple manufacturers. Among common automotive electronic modules, the microcontroller manufacturers used include Atmel, Motorola, Freescale, Infineon, Renesas, STMicroelectronics, etc. As shown in Figure 6.1.1.

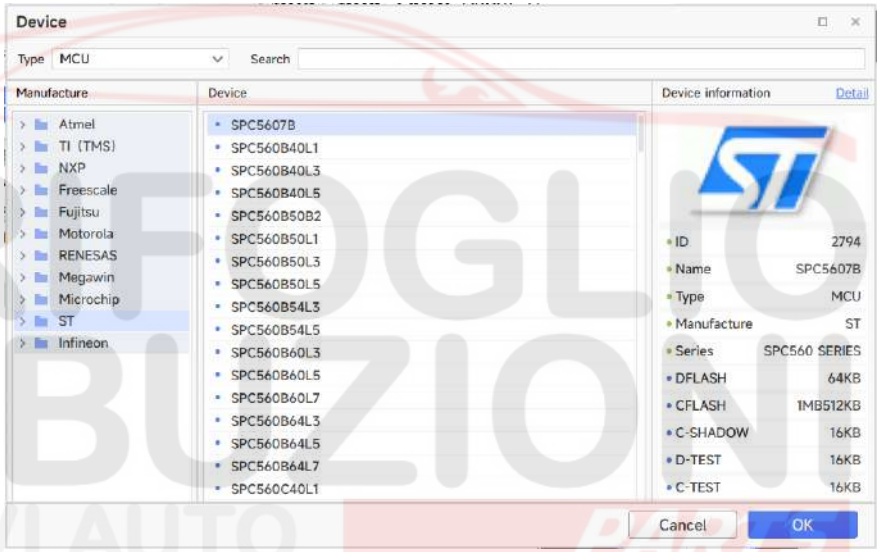

Figure 6.1.1

6.2 Microcontroller Memory Area Division

Microcontroller usually has three storage spaces: program area, data area and configuration area. The program area stores the program data of the microcontroller. The data area stores the information data of the microcontroller. And the configuration area stores the corresponding configuration data of the microcontroller, such as the encryption byte option, the startup byte option, and so on. When reading and writing microcontroller data, it is necessary to distinguish by different areas. In software, names such as FLASH, CFLASH, CODE, and ROM are usually used to represent the program area. The names such as DFLASH, EEPROM, DATA, INF, etc. are represent the data area. The names such as Config are represent the configuration area. Please note that the configuration area may be unreadable for encrypted chips.

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6.3 Microcontroller Wiring Diagram (Example)

The microcontroller option provides wiring diagrams for basic read/write of the corresponding microcontroller. During the actual read/write process, a multimeter is necessary to find the connection diagram for the specific board, as shown in Figure 6.3.1.

- **Optional (must be low):** When reading this microcontroller, you must make sure that this pin of the board is low before you can read it. If it is not low, you can connect a 1K pull–down resistor to GND on this pin.
- **Pull–up resistor:** This pin needs to be connected to a pull–up resistor to VCC when
- reading.
  If the crystal frequency is not 4 megahertz, please connect pin 1 of the chip to the CLK output of the programmer: When reading, this pin needs to be checked whether it is necessary to connect an external clock pin for reading.

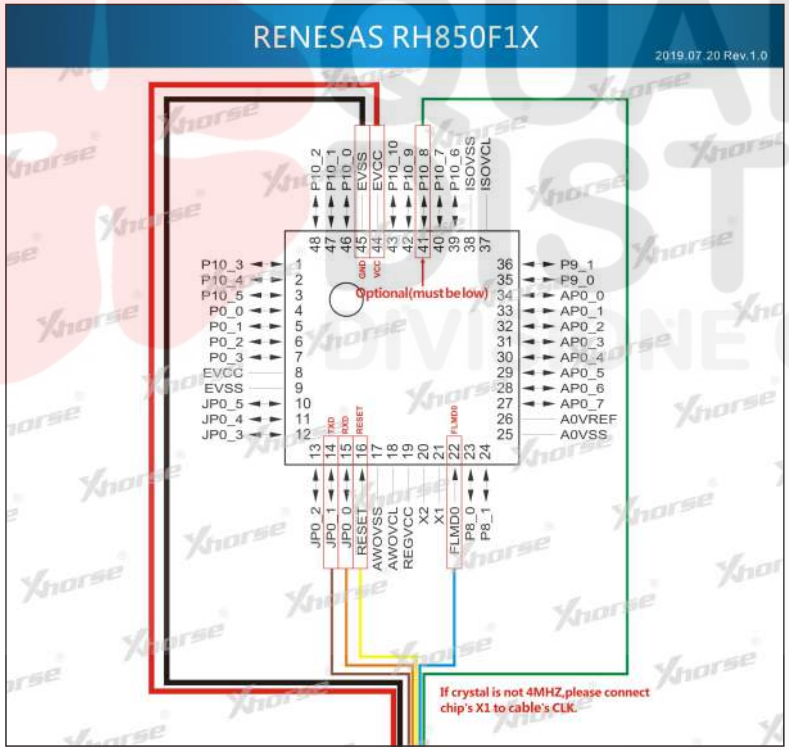

Figure 6.3.1

7 Automotive Electronics Module Read/Write Operation

7.1 Automotive Electronic Module Read/Write Function Introduction

Multi–PROG supports reading and writing common automotive immobilizer modules and other electronic modules. The software interface, as shown in Figures 7.1.1 to 7.1.4, mainly contains functions for reading, writing and programming of immobilizer module, dashboard module, airbag module and other car body electronic modules. Select read/write option based on vehicle model specific electronic module type. The corresponding module circuit connection diagram is provided in the software.

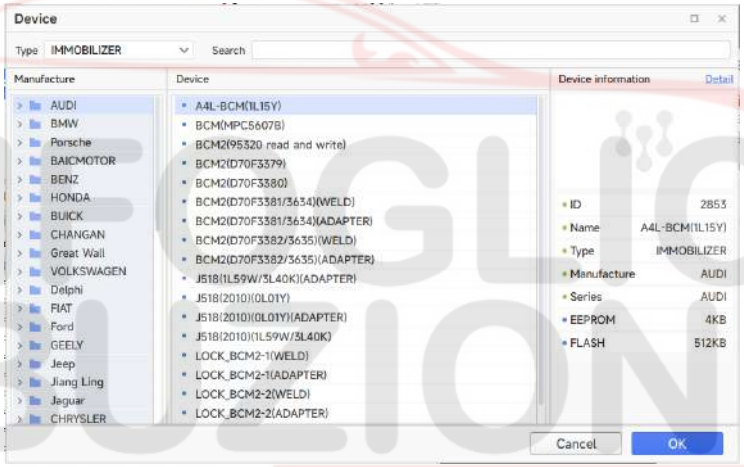

Figure 7.1.1 Immobilizer Module

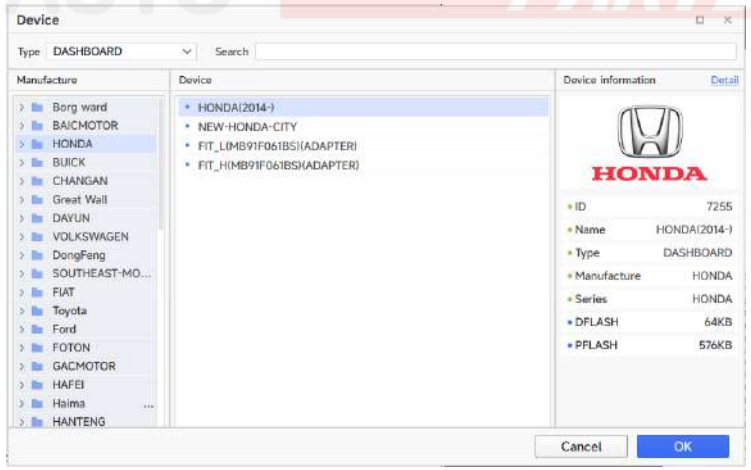

Figure 7.1.2 Dashboard Module

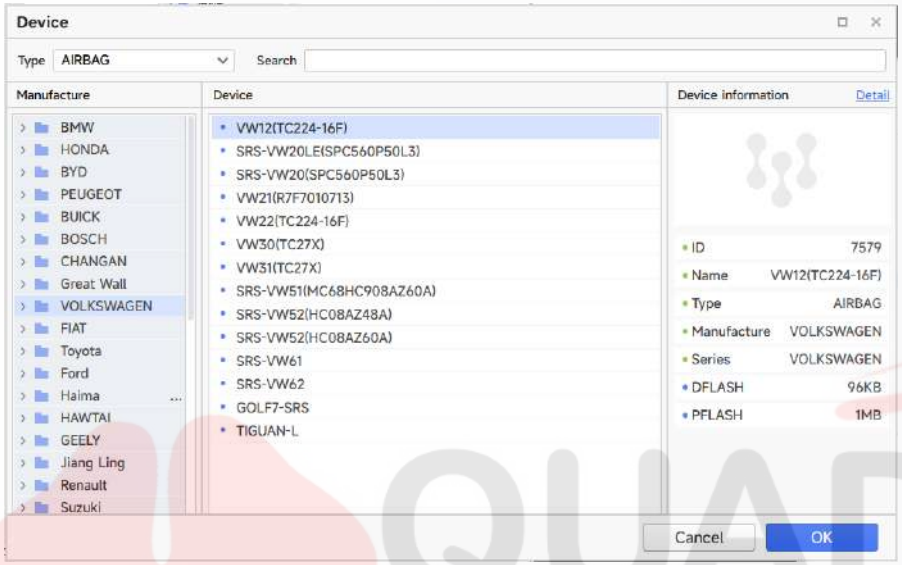

Figure 7.1.3 Airbag Module

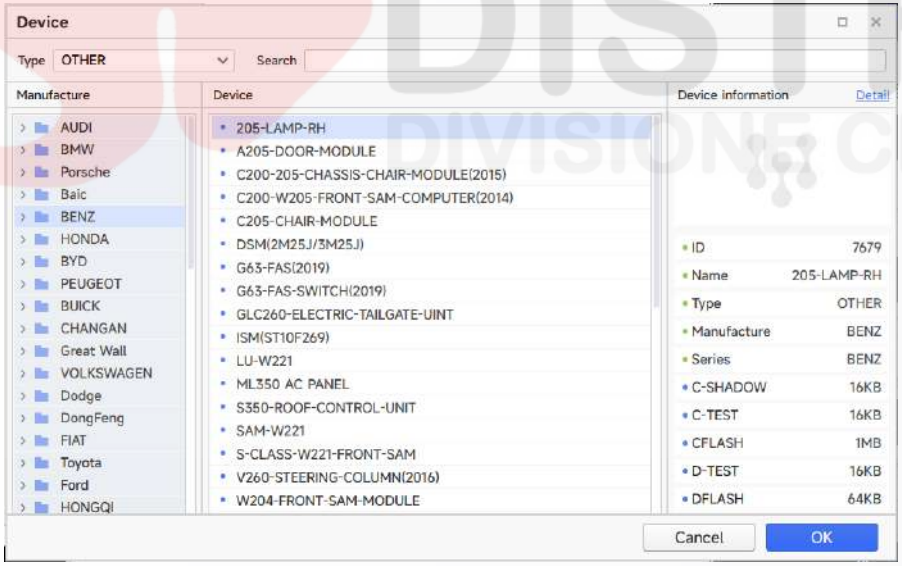

Figure 7.1.4 Other Car Body Electronics Modules

7.2 Example of Porsche Module Read/Write

Multi-PROG supports encrypted reading and writing of Porsche front-end modules. As shown in Figure 7.2.1 and 7.2.2, when selecting'Anti-theft/Porsche' and reading the module, we usually choose the backup option corresponding to the chip mask to read.

Operation steps:

1. Enter the Porsche menu option in the device software.

2. Connect the Multi-PROG device, module and adapter, pay attention to see whether the actual module is a ceramic crystal or a metal crystal, use the corresponding connection method according to the crystal type, as shown in Figure 7.2.2.

3. Perform backup read, write, unlock and lock operations.

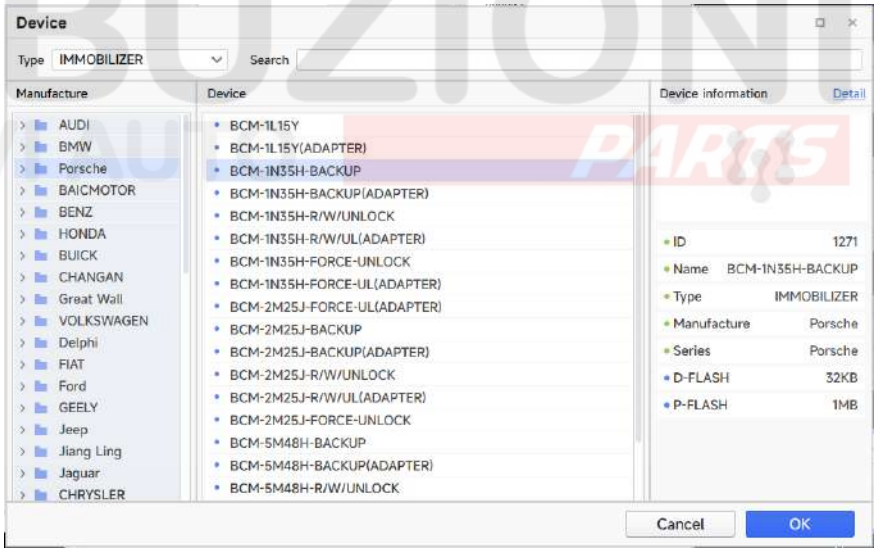

Figure 7.2.1



Figure 7.2.2

7.3 Example of Volkswagen Phideon Tire Pressure Module Read

Operation steps:

1. Find the option corresponding to the tire pressure module, as shown in Figure 7.3.1.
2. Solder the MCU cable to the module according to the diagram, and then connect the device, as shown in Figure 7.3.2.
3. Use the device to read and write.

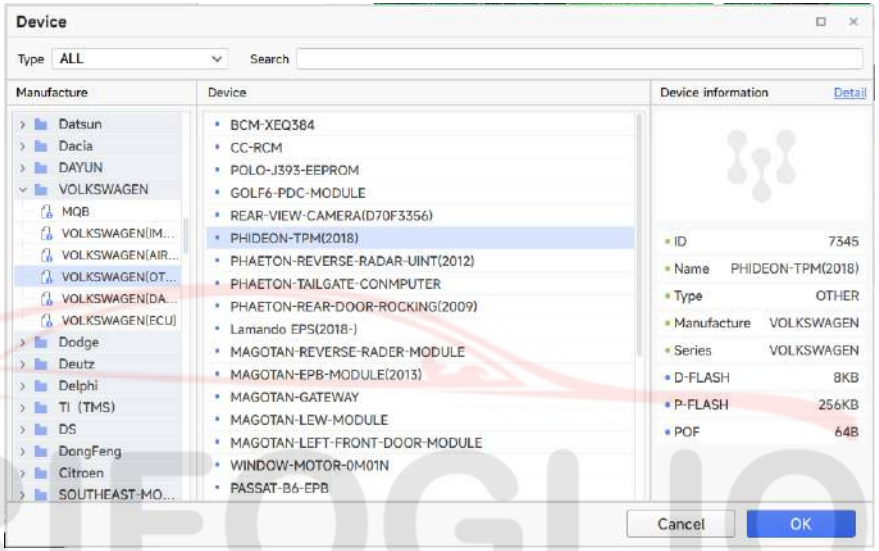

Figure 7.3.1

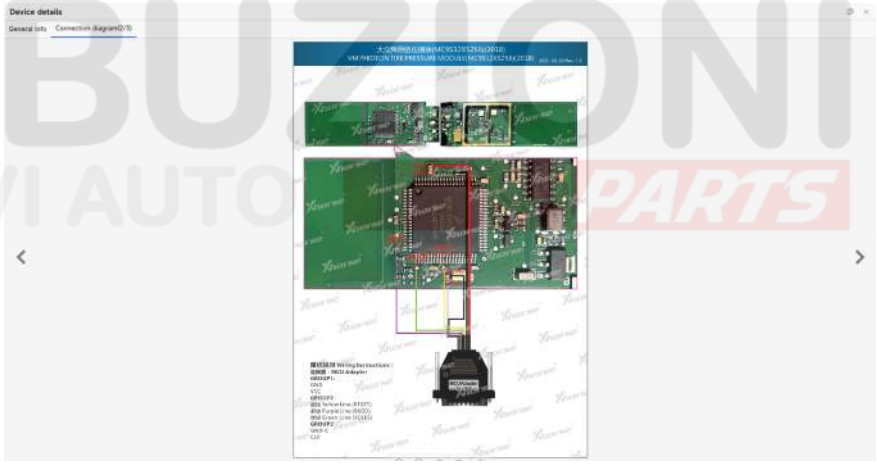

Figure 7.3.2

8 Automotive ECU Read/Write Operation

As a multi-functional programmer device, the Multi-PROG device supports reading, writing and cloning ECU for some common brands of automobiles, which can be used for automotive ECU repair and replacement, etc.

8.1 Supported ECU Types

Usually, the ECU of each brand of automobile is provided by third-party manufacturers, and the common automobile ECU manufacturers are Bosch, Siemens, Continental, Marelli and Delphi, etc. The Multi-PROG programmer supports the reading, writing and cloning ECU of common brands such as Bosch and other manufacturers.

It supports BMW MSV90, MSV80 and other series ECU reading, writing and cloning, supports BMW B48, B58 series ECU reading ISN, supports Mercedes-Benz SIM271 series ECU reading and writing, supports VW Bosch ECU MED17 series reading, writing and cloning.

8.2 Example of ISN read and clone of a BMW MSV90 ECU

Operation steps:

1. Select the module type'ECU/BMW/1-Series' menu, and select MSV90 as shown in Figure 8.2.1.

2. Connect according to the wiring diagram shown in the software. Attention: choose the appropriate ECU cable plus, the device comes with 8 different kinds of ECU cable plus.

3. If the ISN is required, the ISN will be displayed in the device software after reading the EEPROM. If the ECU needs to be cloned, the EEPROM and FLASH need to be read and saved, and the saved data should be written to the ECU to be replaced.

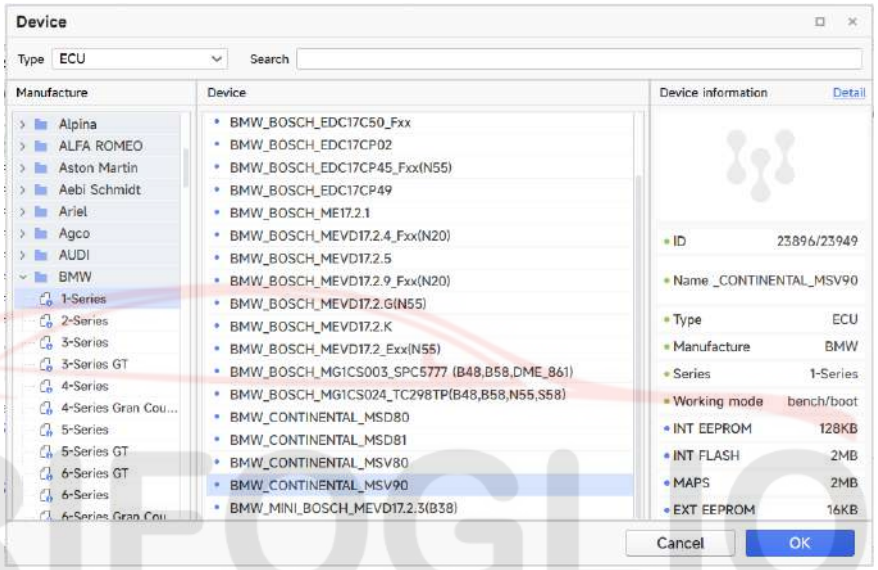

Figure 8.2.1

8.3 Example of Read, Write and Clone of Mercedes-Benz SIM271 ECU

Operation steps:

1. Select the module type 'ECU/Mercedes/C-class', as shown in Figure 8.3.1.

2. Connect according to the wiring diagram shown in the software. Attention: choose the appropriate ECU cable plus, the device comes with 8 different kinds of ECU cable plus.

3. If the ECU needs to be cloned, the EEPROM and FLASH need to be read and saved, and the saved data should be written to the ECU to be replaced.

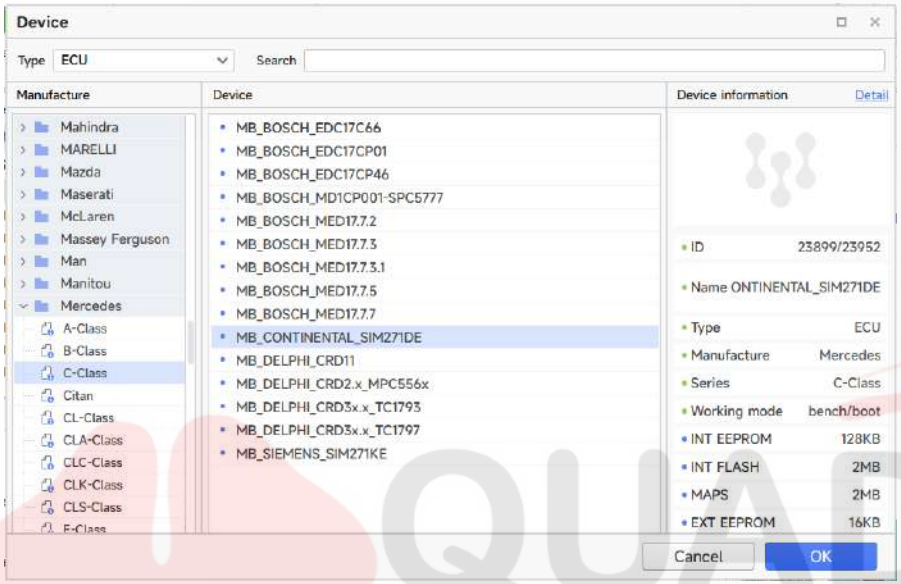

Figure 8.3.1

9 Automobile TCU Read/Write Operation

Similar to ECUs, usually the TCUs for major brands of automobiles are also provided by third-party manufacturers.

9.1 Supported TCU Types

The device supports TCU read/write for Volkswagen Audi Skoda DQ200, DQ250, VL381, Porsche DL501, Ford Dodge and other MPS6 series TCUs, and it also supports reading and writing other models of TCUs such as BMW DKG, Mercedes-Benz VGS, etc.

9.2 Audi A4 VL381 Series TCU Read/Write

Operation steps:

1. Select the module type'Transmission/Audi/VL381' as shown in Figure 9.2.1.

2. Connect according to the wiring diagram shown in the software. Attention: choose the appropriate cable plus, the device comes with 8 different kinds of cable plus.

3. If the TCU needs to be cloned, the EEPROM and FLASH need to be read and saved and the saved data written to the ECU computer to be replaced.

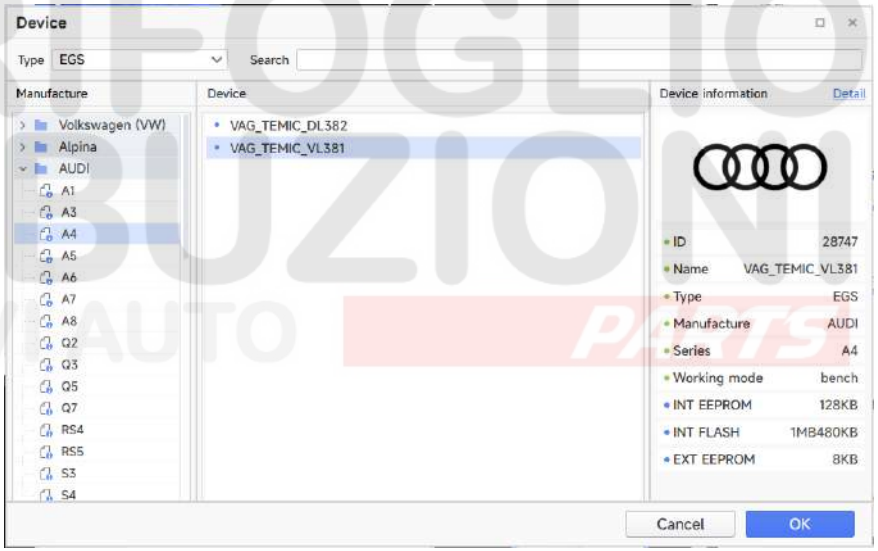

Figure 9.2.1

10 Third-party script function

Multi-PROG device supports read and write related chips, but some chips, usually need to modify some data before writing. The device provides a scripting interface, which allows you to process and save the original data using scripts developed by third parties, and then write it using the device. The software script interface is shown in Figure 10.1.

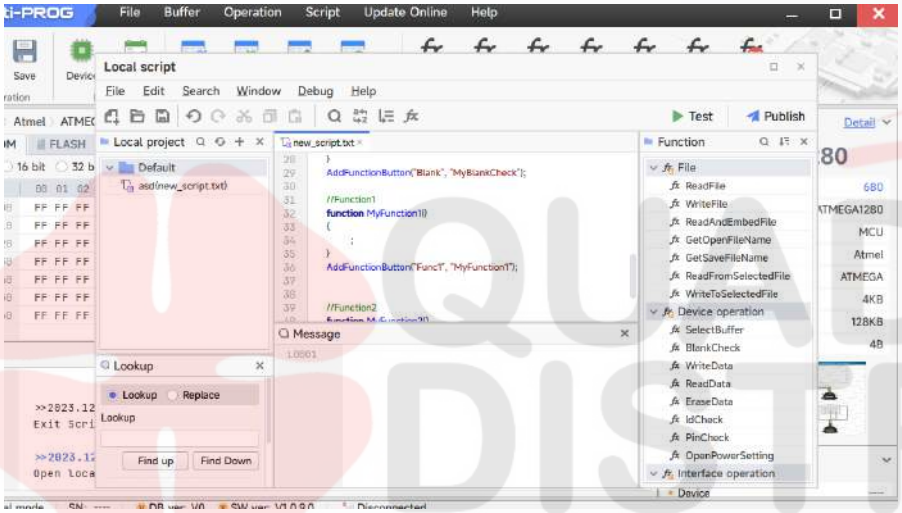

Figure 10.1

10.1 Use of Script Function

After the device enters the read/write option, tap the script function, select 'Published Functions', and then select the specific function script you want to use. Then you can run the corresponding script and use the script function. As shown in Figure 10.1.1, the script provides the function of modifying data.

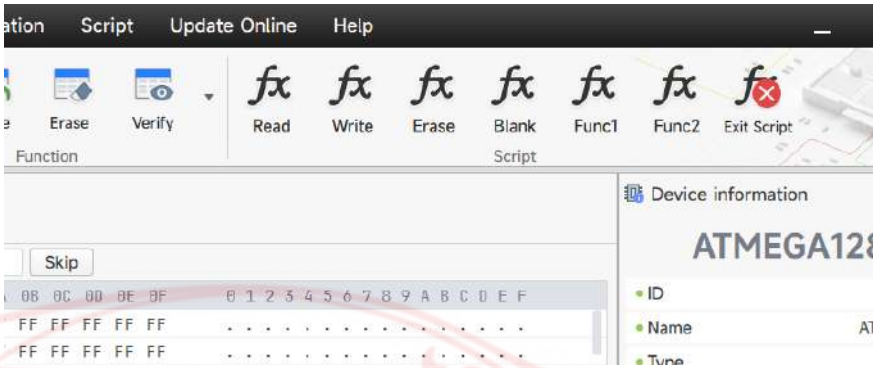

Figure 10.1.1

10.2 Development of Script Function

Please refer to the script development documentation that comes with the software for script development methodology and development examples, no further details are provided here.

11 Chip batch write function

Multi-PROG supports batch writing of chips, and batch writing of chips is often used in factories when production requires large-scale writing of chips. The types of writes supported are common memory series and common microcontroller series.
For the specific usage of batch writing, please refer to the documentation of the factory usage mode that comes with the software, no further details are provided here.

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12 Warranty and after-sales instructions

The warranty period for Multi-PROG devices is one year, based on the date on the transaction voucher, if no transaction voucher is available or if the transaction voucher is lost, The factory date recorded by the manufacturer shall prevail.
In order to avoid causing personal injury, vehicle damage, etc., please read this operation manual carefully before you operate, the following conditions are not covered by the warranty:

- Failure to use the machine in accordance with the instructions resulting in machine failure
- Damage to the machine due to self-repair or modification
- Machine failure due to drop, collision or improper voltage
- Damage to the machine due to force majeure
- Malfunction or damage to the machine due to prolonged use in bad conditions or on vehicles or ships
- Dirt and wear on the housing of the main unit due to use

For product maintenance and technical support, please contact the dealer or download the Xhorse official APP, consult online customer service, or add this skype account: live:.cid.1c698c9c01ec2482 .

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