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1. Introduction

1.1 Background

The days of diagnosing and repairing automobiles without a laptop beside you are quickly fading. Newer vehicles include a large number of onboard computers that are each dedicated to performing specific tasks. Common onboard computers in newer vehicle include the Engine Control Module (ECM), Transmission Control Module (TCM), Fuel Injection Control Module (FICM), Anti-lock Brake System (ABS), Body Control Module (BCM) and numerous other control modules to manage every electronic system from power door locks to crash data.

Each onboard computer is programmed at the factory with software enabling it to perform certain tasks. Inside the ECM is software containing hundreds or even thousands of parameters to control spark, fuel, idle, cruising, emissions, economy, drivability, and performance. Likewise, a TCM will have software to control how the transmission and torque converter function. Sometimes, after the vehicle is shipped from the automaker, updates are released to improve emissions, fuel economy, drivability, performance, or specific bugs in the original software that have caused warranty issues. Updating this software can be a proactive fix because often it will resolve problems that a customer hasn't reported or noticed yet.

The practice of updating software in these modules is more commonly known as flash reprogramming. At new car dealerships, flash reprogramming is relatively straight forward because service technicians are connected to the automaker and have the expensive, specialized dealer service tools dedicated to reprogramming. The independent repair shops have faced a more difficult challenge because most shops typically service more than one make of vehicles. This increases the complexity, cost and training required to operate dozens of different factory service tools.

1.2 J2534 - A Solution Arrives

In 2000, the Environmental Protection Agency (EPA) had been watching this issue and decided to take action. The EPA requested a standard be developed within the SAE that led to J2534, a mandated specification to which automakers who sell vehicles in the United States must conform. The original J2534 specification was later updated to J2534-1 in order to support all automakers. The EPA mandate requires automakers to support aftermarket repair shops with J2534-1 flash reprogramming for any emissions related computer modules on a vehicle that can be reprogrammed by a new car dealership. This mandate took effect for all 2004 and newer vehicles.

SAE J2534 is a standard devised of two independent parts: subscription software and a J2534 compliant Pass Thru vehicle interface. The subscription software comes directly from the automaker, runs on your shop PC or laptop, and can either be web-based or CD-based. The subscription fees are charged differently for each automaker.

1.3 Pass-Thru Vehicle Interface

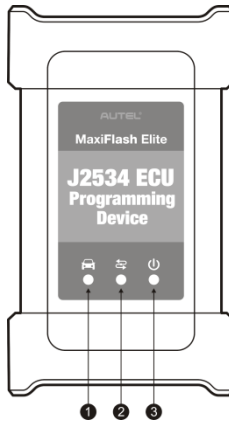
The second part of the system is a SAE J2534 compliant Pass-Thru vehicle interface. This device acts as a gateway between the vehicle's onboard computers and the technician's personal computer. It translates messages from the PC into the protocols used by the automobile and vice versa.

Performing J2534 reprogramming requires computer knowledge and experience. The technician will need to operate a laptop or desktop, the Pass-Thru device, and the reprogramming software. Operation will also require a good high-speed connection to the Internet such as DSL, Cable, or T1.

2. Getting to Know MaxiFlash Elite

Thank you for choosing the MaxiFlash[®] Elite Reprogramming Device! This multi-protocol Pass-Thru vehicle interface is a fully compliant SAE J2534-1 & SAE J2534-2 (March 2006) device, specially designed to provide users with convenient PC communication and ECU reprogramming capabilities on any modern vehicle diagnostic bus, and offer the most significant features desired by OEM customers: reliability, fast performance and flexibility.

2.1 Front Panel



- 1) Vehicle LED
- 2) Connection LED
- 3) Power LED

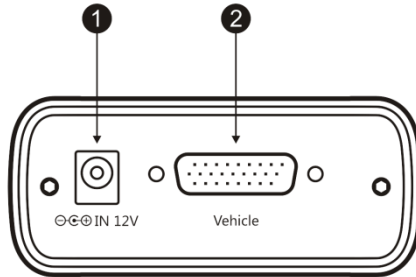
There are 3 status LEDs on the front panel of the reprogramming tool, which indicates the Pass-Thru interface's working status as well as the hardware conditions, and are very useful for troubleshooting the device's communication or connection to the Vehicle or PC. Please refer to **Table 1** for detailed description of the status LEDs.

TABLE 1—STATUS LEDS ON THE FRONT PANEL

LED	Color	Description
Vehicle	Green	Flashes green when communicating with the vehicle's system. <i>Note: Do not disconnect while this status LED is on! If you interrupt the flash reprogramming procedure while the vehicle's ECU is blank or only partially programmed, the module may be unrecoverable.</i>
Connection	Green	Illuminates solid green when properly connected with the display tablet via the USB cable
	Blue	Illuminates solid blue when connected with the display tablet via wireless (BT) connection
Power	Green	Illuminates solid green when powered on.
	Red	Flashes red when system failure occurs.
	Amber	The power LED illuminates amber automatically every time when the device is power up, which is a normal self-test procedure, and it will turn green automatically later when the device starts working normally.

2.2 Top Panel

Connections to the **power adapter** and **vehicle** are available on the top panel.



1) Power Port

The power port (DC 12V) connects the device and the power source with the adapter, which supplies power to the reprogramming tool.

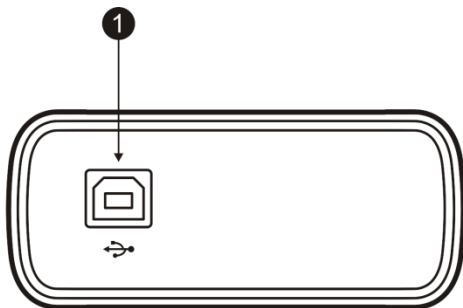
2) Vehicle Connector

The Vehicle connector connects the device to the vehicle's DLC via a standard high density DB-26 MVCI – OBDII cable.

2.3 Bottom Panel

The MaxiFlash[®] Elite Pass-Thru device supports two ways of PC connection: **USB** and **wireless BT**, which make PC communication and vehicle reprogramming all the more convenient and easy for technicians.

The embedded wireless BT module, which offers higher bandwidth and distance range, can be detected and paired to Autel's MaxiSys diagnostic tablet and serves as a Vehicle Communication Interface (VCI) device for data transmission. The USB connection port to the PC is available in the bottom panel of the device.



1) USB Port

The USB port provides the easiest connection between the device and the MaxiSys Display Tablet/PC via a USB cable.

2.4 Power Up

The Pass-Thru vehicle reprogramming device can be powered either via the vehicle DLC, or the external power adapter.

✓ Vehicle Power Supply

- 1) Connect the MVCI – OBDII cable to the reprogramming tool.
- 2) Find DLC on vehicle.

☒ *A plastic DLC cover may be found for some vehicles and you need to remove it before plugging the OBDII cable.*

- 3) Plug OBDII cable to the vehicle's DLC.
- 4) Wait for the reprogramming tool to power up.

✓ External DC Power Supply

- 1) Locate the power port of the device.
- 2) Connect the device and the power source with the power adapter.
- 3) Wait for the reprogramming tool to power up.

☒ *NOTE: The external power supply does not support power charging to the vehicle battery.*

2.5 Specifications

The MaxiFlash Elite Reprogramming Device is powerfully featured to be desired by all OEM customers:

- Supports simultaneous communication definition in J2534-1, running 3 protocols at the same time, which greatly improves reprogramming and diagnostic speed.
- Supports multiple device connections to the PC, which can operate diagnostic and reprogramming functions on more than one vehicle at the same time.
- Embedded with the ARM9 Dual-core processor (clocked up to 500MHz), which further boosts the communicating speed.
- Rugged aluminum case with non-slip rubber end caps, capable of withstanding harsh environment.

Check up detailed specifications in the following table:

TABLE 3 – DEVICE SPECIFICATIONS

Name	Value
Communications	Wireless BT V2.1 + EDR, USB 2.0
Wireless Frequency	Wireless BT V2.1+EDR, 2.4GHz
Input Voltage Range	12VDC to 24VDC
Supply Current	170mA @ 12VDC 100mA @ 24VDC
Operating Temperature	0°C to +60°C (ambient)

Name	Value
Storage Temperature	-65°C to +100°C (ambient)
Dimensions	Length: 149 mm (5.87") Width: 86mm (3.38") Height: 35 mm (1.28")
Weight	0.29kg (0.64lb)

Bus Protocols

- Primary CAN/ISO15765/GMLAN
- Secondary CAN/ISO15765/GMLAN (Dual or Single Wire)
- Ford SCP (J1850PWM)
- GM Class2 (J1850VPW)
- KWP2000 (ISO9141/14230)
- Chrysler SCI (J2610)

Other

- Compliant to SAE J2534-1 (2004) and J2534-2 (2006) reprogramming standards
- Compliant to ISO 22900-1 MVCI physical layer

2.6 Accessories Included

- 1) **User's Manual** - Instructions on tool operations
- 2) **MVCI to OBDII Cable** - provides power to tool and communicates between tool and vehicle, high density DB-26
- 3) **USB Cable** - allows easy connection to PC/MaxiSys display tablet.

- 4) **Power Adapter** - supplies power to the reprogramming tool.
- 5) **CD** - includes user's manual, software development kit, device driver, etc

2.7 Product Troubleshooting

This part describes problems that you may encounter while using the reprogramming tool.

Vehicle Linking Error

A communication error occurs if the reprogramming tool fails to communicate with the vehicle's control module when perform the program re-flash. You need to do the following check-ups:

- ✓ Verify that the ignition is ON.
- ✓ Check if the reprogramming tool's OBD II connector is securely connected to the vehicle's DLC.
- ✓ Turn the ignition off and wait for about 10 seconds. Turn the ignition back to on and continue the operation.
- ✓ Verify the control module is not defective.

PC Communication Error

If you cannot communicate the device to the PC, you need to do the following check-ups:

- ✓ Verify the reprogramming tool is powered, and the green power LED is illuminated.
- ✓ Check if there is any firewall software interfering with the connection port.
- ✓ Check if the green status light is illuminated for USB communication.

If these issues have been addressed, verified, and you are still having trouble, please contact technical supports for assistance.

3. Driver Setup & Network Configuring

3.1 Driver Setup

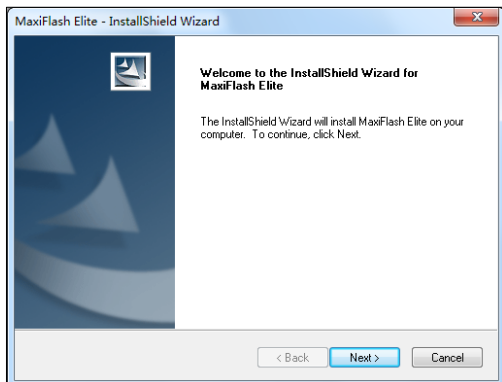
In order for the Pass-Thru Device to operate correctly with the re-flashing and diagnostic applications on the target PC, you will need to first install the MaxiFlash Elite J2534 device driver onto the PC that will control the device.

To setup the J2534 Pass-Thru device driver, you will need the followings:

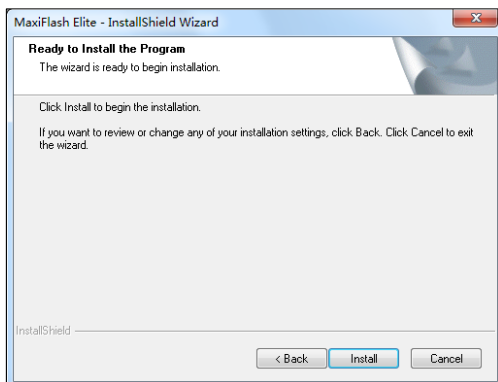
- ✓ CD with the device driver program
- ✓ PC or laptop with USB ports
- ✓ J2534 Pass-Thru reprogramming tool
- ✓ USB cable


☒ *NOTE: The following steps may vary depending on the operating system or components that are installed on your computer, but in general this is the standard installation process.*

- 1) Insert the driver installation CD to your PC and open the CD folder.
- 2) Double click on “**Autel Run.exe**” item.
- 3) Click the MaxiFlash Elite icon in the MaxiSys PC Suite screen.
- 4) Select the installation language and the installation wizard will load momentarily.
- 5) Follow the wizard instructions on the screen and click “**Next**” to continue.

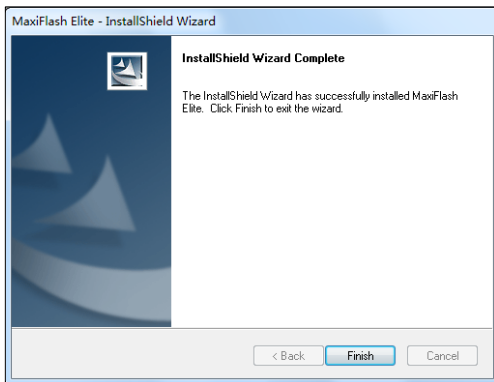


- 6) Click on “**Install**” and the driver program will be installed onto your PC.



-  **NOTE:** During this part of the process a MS-DOS style window may pop up and may remain on your screen for a short while, which is perfectly normal. Do not attempt to close the MS-DOS style window manually as this will prevent the device driver being installed successfully, it will close automatically when the device driver installation is complete.

- 7) When the driver is successfully installed, a confirm window will appear. Click on “**Finish**” to complete the whole installation procedure.



3.2 Firmware Update

This function allows you to update the driver software for the Pass-Thru device through the PC. Make sure the PC is connected to the Internet before using this function.

- 1) Power up the device by the external power supply; verify the green Power LED on the front panel is on.
- 2) Connect the Pass-Thru device to the PC with the supplied USB cable; verify the green Connection LED on the front panel is on.
- 3) From Windows Start Menu, find and double click the “**MaxiFlash Elite**” icon, wait for the program interface to pop up.

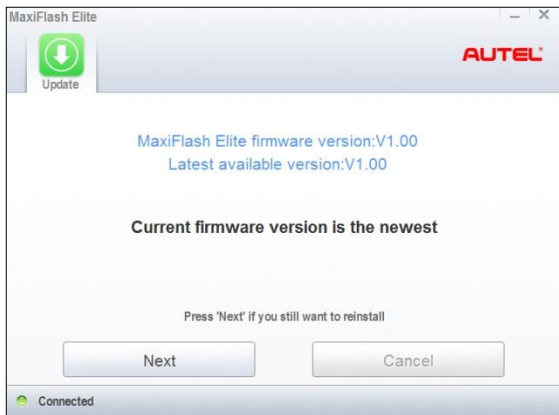


Figure 3.5

- 4) The update agent will automatically check for the available update online.
- 5) Press the “**Next**” button to install the newest firmware.
- 6) Press the “**Cancel**” button to exit.

4. Reprogramming with J2534 device

To reprogram vehicles using OEM software, you can find a list below of websites that offer subscription software, or visit <http://etools.org/> website to find out more ECU re-flash applications from the OEMs.

Using additional OEM software, the MaxiFlash Elite can be used as a Pass-Thru diagnostics tool as well, which allows users to read and clear Diagnostic Trouble Codes (DTCs) and data log PIDS, collect sensor data and log generic OBDII data etc.

Since J2534 allows multiple devices to be connected at once, you must tell the software you want to use the MaxiFlash Elite. Every application will have a different way to select the device, so please consult the software manual.

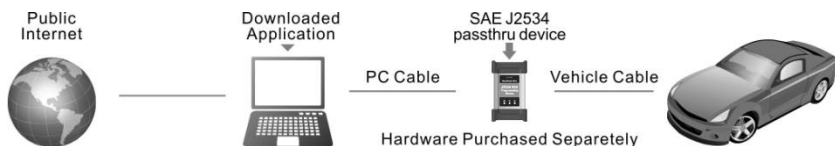



TABLE 4 – LIST OF AUTOMAKERS’ SERVICE WEBSITES

Automaker	Website
BMW	http://www.bmwtechinfo.com/
Mini	http://www.minitechinfo.com/
Porsche	http://www.porsche.com/
Chrysler, Jeep, Dodge	http://www.techauthority.com/
Ford, Lincoln, Mercury,	http://www.motorcraft.com/

Automaker	Website
Land Rover	http://www.landrovertchinfo.com/
Volvo	http://www.volvotechinfo.com/
Cadillac, Chevrolet, Daewoo, GM, GEO, Pontiac, Buick, Saturn, SAAB	http://www.gmtechinfo.com/
Acura, Honda	http://www.serviceexpress.honda.com/
Isuzu	http://www.isuzutechinfo.com/
Mazda	http://www.mazdaserviceinfo.com/
Mercedes	http://www.startekinfo.com/
Mitsubishi	http://www.mitsubishitechinfo.com/
Nissan	http://www.nissan-techinfo.com
Toyota, Lexus, Scion	http://techinfo.toyota.com/
Volkswagen	http://www.erwin.volkswagen.de/erWinVW
Audi	http://erwin.audi.de/erWinAudi

 **NOTE:** When reprogramming onboard, always make sure the vehicle battery is fully charged and in good working condition. During reprogramming there is a risk of having the operation failure if voltage falls below the proper operating voltage. Sometimes a failed operation can be recovered, but there is a chance that failed reprogramming could ruin the control module. We recommend connecting an external battery charger to the vehicle to ensure a successful operation.

5. Compliance Information

FCC COMPLIANCE

FCC ID: WQ815MXFELITE

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: **i**. Reorient or relocate the receiving antenna. **ii**. Increase the separation between the equipment and receiver. **iii**. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. **iv**. Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

RoHS COMPLIANCE

This device is declared to be in compliance with the European RoHS Directive 2011/65/EU.

CE COMPLIANCE

This product is declared to conform to the essential requirements of the following Directives and carries the CE mark accordingly: EMC Directive 2014/30/EU
RED Directive 2014/53/EU Low Voltage Directive 2014/35/EU

6. Warranty and Service

6.1 Limited One Year Warranty

Autel warrants to its customers that this product will be free from all defects in materials and workmanship for a period of one (1) year from the date of the original purchase, subject to the following terms and conditions:

- 1) The sole responsibility of Autel under the Warranty is limited to either the repair or, at the option of Autel, replacement of the Pass-Thru device at no charge with Proof of Purchase. The sales receipt may be used for this purpose.
- 2) This warranty does not apply to damages caused by improper use, accident, flood, lightning, or if the product was altered or repaired by anyone other than the Manufacturer's Service Center.
- 3) Autel shall not be liable for any incidental or consequential damages arising from the use, misuse, or mounting of the device. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.
- 4) All information in this manual is based on the latest information available at the time of publication and no warranty can be made for its accuracy or completeness. Autel reserves the right to make changes at any time without notice.

6.2 Service Procedures

If you have any questions, please contact your local store, distributor or visit our website at www.autel.com.

If it becomes necessary to return the tool for repair, contact your local distributor for more information.