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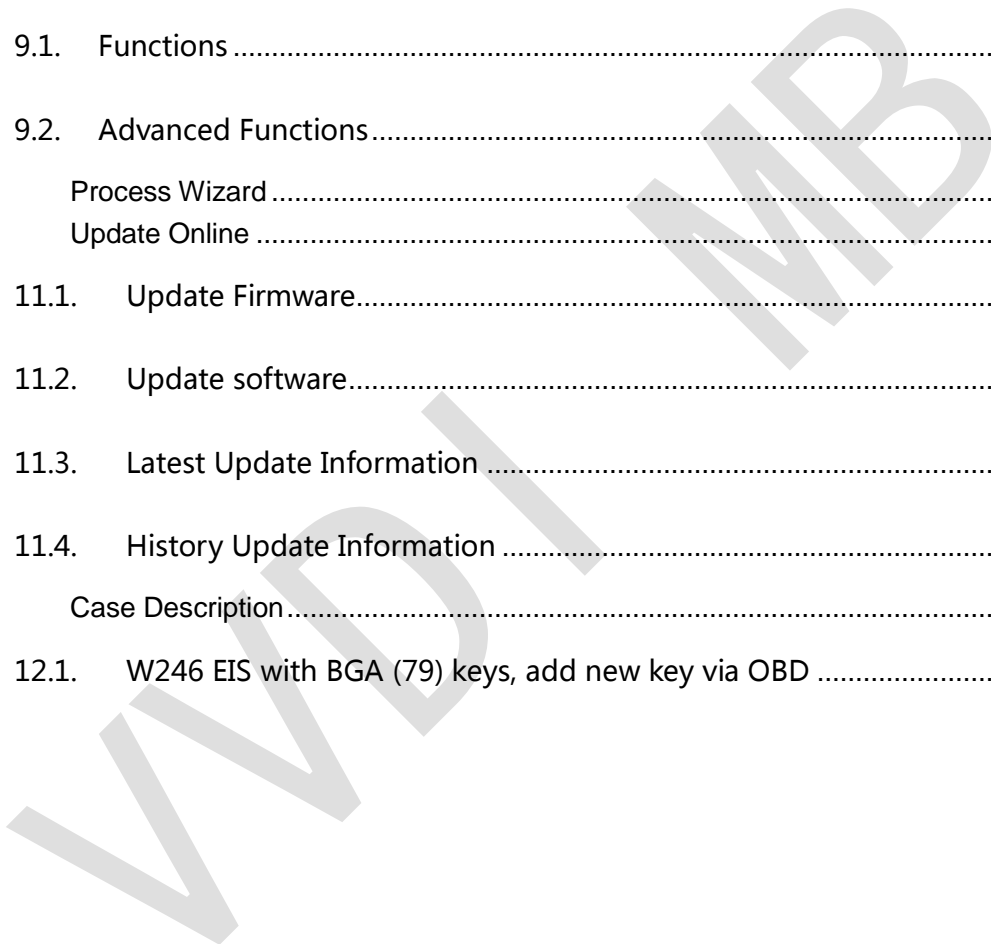
# VVDI – MB TOOL User Manual

VVDI

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# 1.Document Declaration

Please view the following declaration carefully:

- ◆ VVDI – MB TOOL User Manual can help you maintenance vehicles with VVDI MB TOOL device. **Please DON'T used for illegal purpose, Please follow the national law**
- ◆ VVDI – MB TOOL User Manual is written by VVDI-MB, **please DON'T used for commercial purposes without authorize**
- ◆ VVDI – MB TOOL User Manual can help you how to use VVDI – MB TOOL software, please view carefully
- ◆ **Any illegal use VVDI – MB TOOL User Manual, illegal use VVDI – MB TOOL device, The user should take all risks, the company does not assume any responsibility**

## 2. Overview

### 2.1. Noun explanation

- ◆ **Mercedes Benz:** A car brand come from German, we simply use MB, BENZ instead
- ◆ **EIS:** Sometimes we call it EZS. The immobilizer system for MB cars
- ◆ **ESL:** Sometimes we call it ELV
- ◆ **Chassis:** Mainly use to distinguish car platform, the same platform will have same EIS type, example: W204, W216 etc

VVDI MB

## 2.2. VVDI – MB TOOL Hardware



1. VVDI-MB TOOL device
2. IR adaptor
3. USB cable
4. NEC adaptor 1
5. NEC adaptor 2
6. NEC adaptor base PCB
7. K Line in OBD line
8. OBD line

## 2.3. Mainly function

### ◆ Read Write Key

1. Read key basic information
2. Key with BE version, we can read password from key via IR directly. Of course, renew key, write new key file via IR is also supported
3. Support IR repair key, repair key not work via IR
4. NEC adaptor can read key password from NEC v51, v57 version
5. Support write and renew (NEC adaptor) NEC key versions following:
  - v51, v57
  - v28, v35, v40
  - v03, v06, v08 (Keyless Go)
  - v05, v07, v09 (Keyless Go)
  - v59, v61 (Keyless Go)

### ◆ EIS Tools

1. Support read EIS data via OBD and IR adaptor
2. Under OBD mode, we provide auto detect EIS type for CAN protocol
3. Support renew EIS, make 2<sup>nd</sup> hand EIS to new one (online)
4. Support replace EIS, you can write original EIS data to new EIS via IR
5. Support write new VIN
6. Support clear TP
7. Support disable key position
8. Support personalize W204 ESL
9. Support test EIS, ELV, working key status
10. Support type:
  - W164
  - W164 2009-
  - W166, 197, 212, 218, 246
  - W169, 209, 211
  - W172, 204, 207, 212(old, with ELV)
  - W203, 463, 639 (K)
  - W202, 208, 210 (K)
  - W215, 220 (K)
  - W230 (K)
  - W216
  - W221
  - W639 2009-

◆ **Password Calculation: support working key and lost all key**

1. Password calculation can get the key password from working key and EIS(online)
2. CAN protocol EIS all support password calculation (support BGA keys and other NEC keys)
3. We also support calculate password for NEC v51, v57 keys. No soldering.
4. Data acquisition time depends on the key version. It needs about 3.5 minutes -13 minutes, BGA version need about 5 minutes
5. Calculate time in server: 30 seconds – 1 minute
6. Now VVDI-MB TOOL is the fastest tool for password calculation
7. **Lost all key password calculation: Now we support calculate password for W166, W212, W246, W212(old, with ELV) while lost all key**
8. Support type (have working key):
  - W164
  - W164 2009-
  - W166, 197, 212, 218, 246
  - W169, 209, 211
  - W172, 204, 207, 212(old, with ELV)
  - W216
  - W221
  - W639 2009-

◆ **Prepare Key File**

1. Prepare key file means prepare the key file which you will write to new key(online)
2. Prepare key file need about 20 seconds
3. Support VVDI-MB type EIS data and old Motorola EEPROM dump

◆ **ESL Tools**

1. Support read ESL data via OBD (K-Line)
2. Support renew ESL, make 2<sup>nd</sup> hand ESL to new one (online)
3. Support replace ESL, you can write original ESL or EIS data to new ESL
4. Support write new VIN
5. Support clear TP
6. Support auto personalized ESL, no need renew EIS
7. Support check ESL damage status

◆ **Renew ECU/Gearbox**

1. This function support renew, write VIN, personalization operation for module ECU, Gearbox, ISM etc



**◆ Special Instructions (2016.02.26)**

1. Write key via NEC adaptor now don't support. Only support read and renew. Write function will added soon
2. The newest cars after 2015 with FBS4 EIS don't support read data and password, we are researching it
3. For read key from EIS while lost all key, it will add in future
4. Old motorola EIS (K-Line) don't support password calculation now, it will add in future
5. Renew EIS and renew ESL require erase password. Now search erase password have 50% success rate. We are building a new server for erase password. It will support all erase password after new server finished
6. Auto personalized ESL: Now only support auto personalized ESL with key password all 00, we will support all the passwords in future (You can use "Personalize W204 ESL" instead before we publish new version)

## 3.Options

### 3.1. Language

**Please manual set user language after first run program**

Support following languages:

- ◆ **Chinese (Simplified)**
- ◆ **English**

### 3.2. User Manual

Open user manual folder

### 3.3. Open Log

Open log folder

# 4. Read Write Key

Read Write Key support read key basic information, write key file, renew/write NEC key (Support Keyless Go). BE keys can read password directly via IR, renew BE key, write new key file to BE key  
 NEC adaptor support v51, v57 key password

## 4.1. IR mode

**Identification key:** Support read key basic information: SSID, counter, remain times, use times, key number, status, version, mark values etc

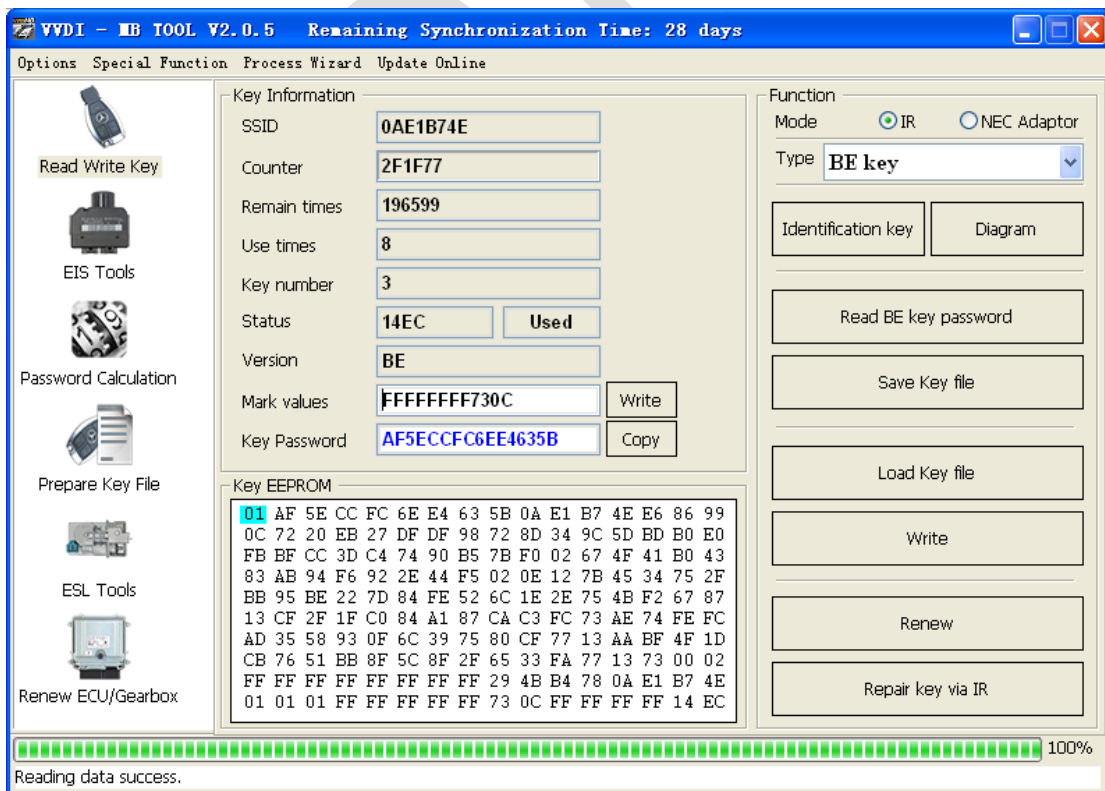
**BE key:** Key version is BE, support read password and key eeprom stored in BE key, write new key file to make a working key, **renew used BE key to new one** etc

**If working key is BE version, you can read password from key directly, no need read password from EIS**

**Write mark values:** Only BE key support, you can write information for yours'

**Copy key password:** You can copy the password to clipboard after success read key password

**Repair key via IR:** When identification key, you can only get SSID, Status, Version, then you can repair this key via IR



## 4.2. NEC Adaptor mode

Renew/Write new key file via NEC adaptor

Support versions:

v51, v57

v28, v35, v40

v03, v06, v08 (Keyless Go)

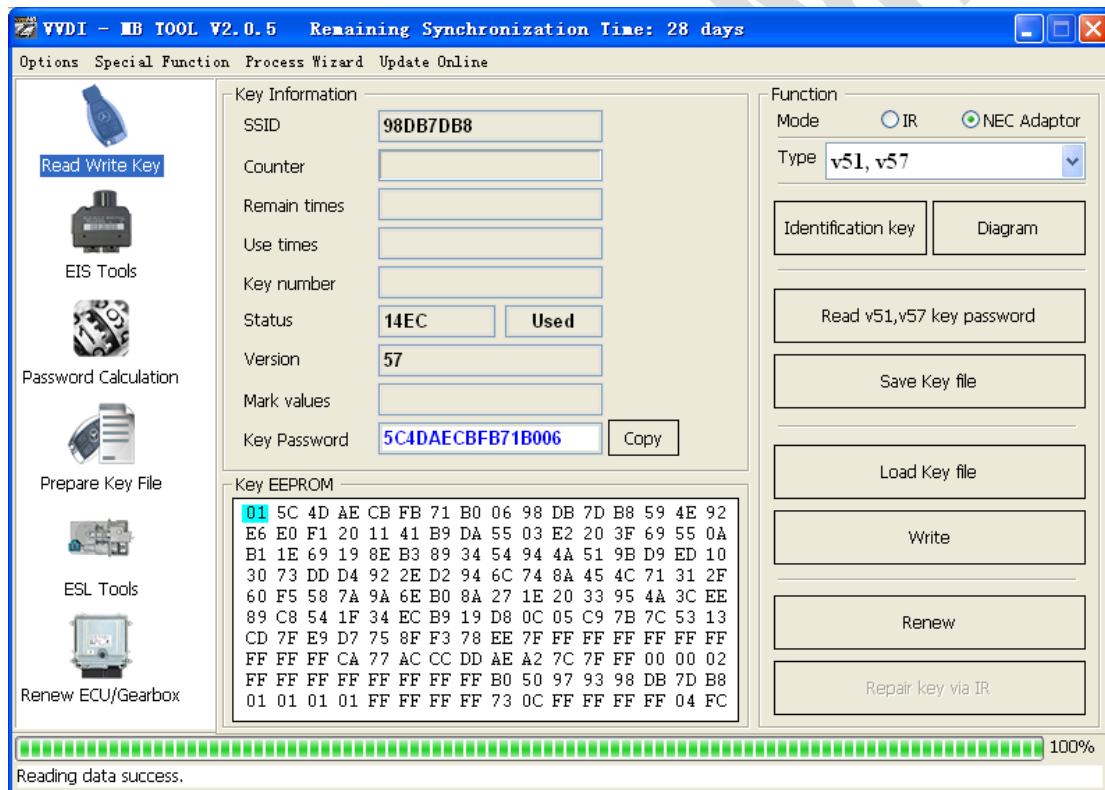
v05, v07, v09 (Keyless Go)

v59, v61 (Keyless Go)

The above keys all with NEC chip (not BGA type). You need solder the NEC chip from key and place it to NEC adaptor

**For NEC v51, v57 version, support read password from working key directly, no need read password from EIS**

**For all NEC types, you must use “Identification key” to read one time before renew/write key**



How to place key NEC chip to adaptor via read/write/renew key via NEC adaptor:

Read/Write key via NEC adaptor

版本: 1 VERSION: 1

适配器底座 Adaptor base PCB  
插槽1 Socket-1 插槽2 Socket-2

适配器1 Adaptor 1  
插槽A CONSA 插槽B CONSB

适配器2 Adaptor 2  
插槽A CONSA 插槽B CONSB

断开 适配器1中的 CON1

v51, v57, v28, v35, v40: 适配器1, 插槽B连接插槽1, CON2断开  
v07, V09: 适配器1, 插槽B连接插槽1, CON2短接  
v03, V06, V08: 适配器1, 插槽B连接插槽2, CON2短接  
V59, v61: 适配器2, 插槽B连接插槽2

Disconnect CON1 in adaptor 1 always

v51, v57, v28, v35, v40: Adaptor 1, CONSA connect Socket-1, CONSB disconnect  
v07, V09: Adaptor 1, CONSB connect Socket-1, CON2 connect  
v03, V06, V08: Adaptor 1, CONSB connect Socket-2, CON2 connect  
V59, v61: Adaptor 2, CONSB connect Socket-2

Version 1    Version 2    Next

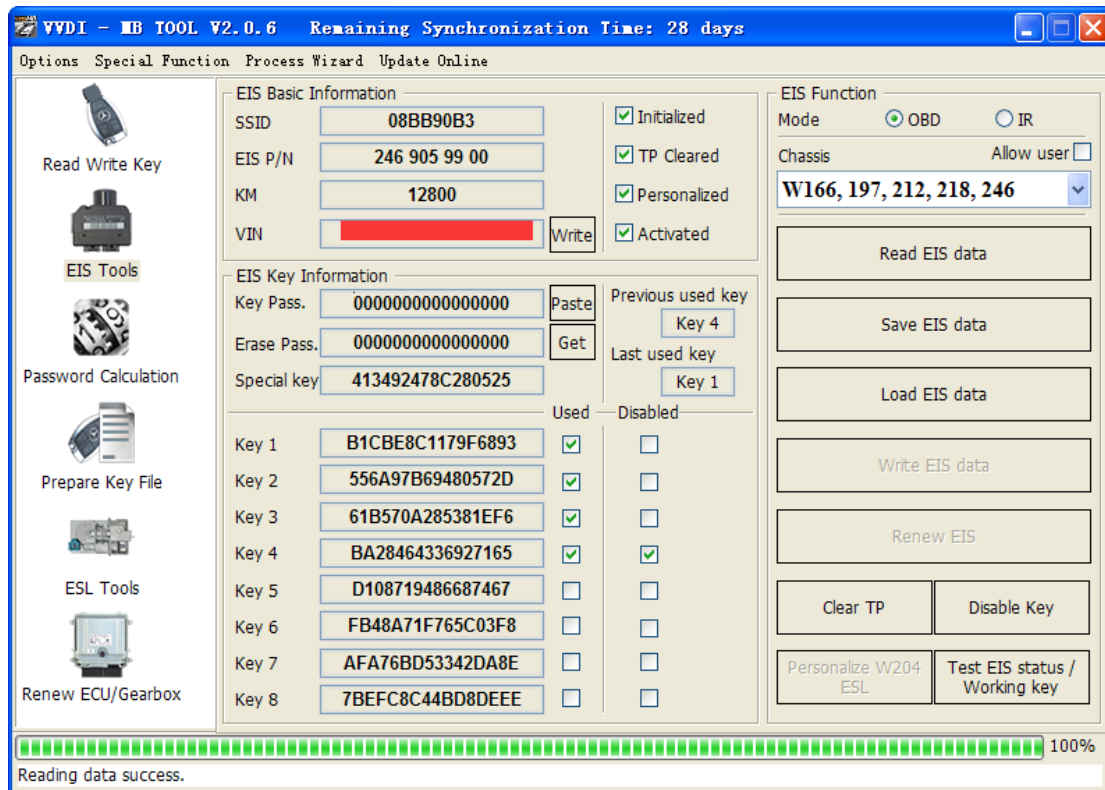
VVDI

## 5. EIS Tools

EIS data can prepare key file

VVDI MB TOOL support 2 mode to read EIS data: OBD and IR adaptor

This picture is read from W246 EIS



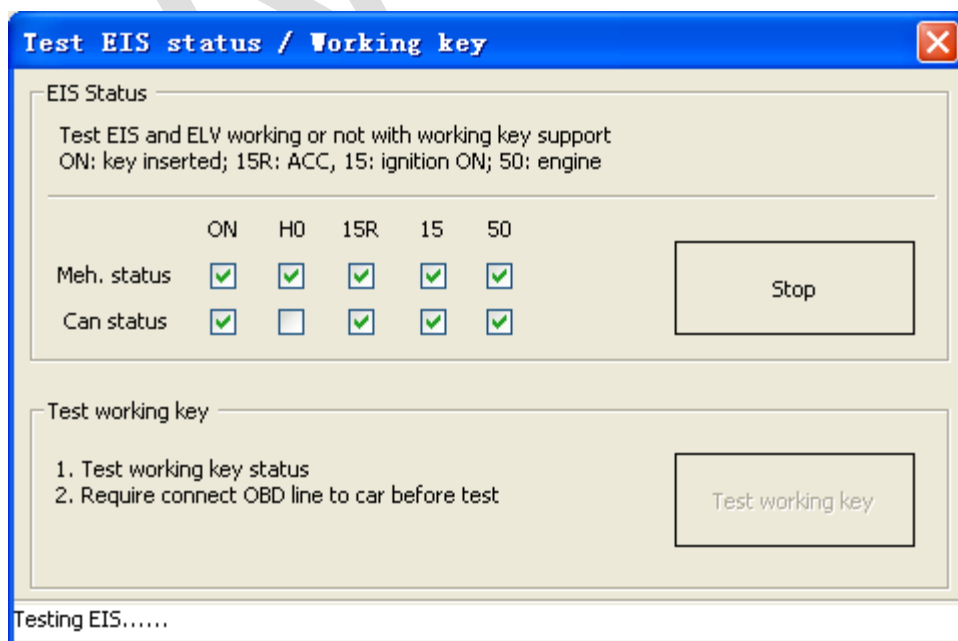
### 5.1. EIS type

Support types:

- W164
- W164 2009-
- W166, 197, 212, 218, 246
- W169, 209, 211
- W172, 204, 207, 212(old, with ELV)
- W203, 463, 639 (K)
- W202, 208, 210 (K)
- W215, 220 (K)
- W230 (K)
- W216
- W221
- W639 2009-

## 5.2. Functions

1. **Mode:** Support OBD and IR adaptor read EIS. You need connect OBD line to car in OBD mode, IR mode only need IR adaptor
2. **Chassis:** EIS type, **support auto detect CAN protocol EIS under OBD mode**
3. **Allow user:** When you select this option, allow input key information, password, VIN manually
4. **Read EIS data:** Read basic information and key information from EIS
5. **Save EIS data:** Save the read EIS data. Support save 2 types: VVDI-MB type and HC05 type
6. **Load EIS data:** Load VVDI-MB type EIS data
7. **Write EIS data:** First you should read EIS or load EIS data, second write EIS data to new EIS. This function can use to replace EIS. Attention: Only support under IR mode, but you must connect OBD line to car
8. **Renew EIS:** Input correct key password and erase password, renew 2<sup>nd</sup> hand EIS to a new one. Attention: Only support under IR mode
9. **Clear TP:** This function only use to close transport protection. Once the EIS activated, this option will be always selected even renew EIS. The EIS without transport protection closed doesn't support write data
10. **Disable Key:** This function can disable key position
11. **Personalize W204 ESL:** This function can synchronize key information from EIS to W204 ESL, use for change W204 ESL. Before run this function, make sure "EIS status: Personalized selected, Activated not selected", "ESL status: Activated not selected". After success, ESL will have personalized selected. Open ignition with working key will activate ESL automatically. Attention: Only support under OBD mode, and chassis number select W172, 204, 207
12. **Test EIS status/Working key:** This function can test EIS, ELV and working key status



### 5.3. EIS Basic Information

- SSID:** The identification ID in EIS, use to recognize key, something like key ID
- EIS P/N:** EIS part number, the front 3 characters is the main type, example: W164, W166, W246 etc
- KM:** KM stored in EIS
- VIN:** VIN stored in EIS
- Write VIN:** Under OBD mode, we support write VIN to ESI without activated status
- Initialized:** Selected means EIS was already initialized. All EIS include new one with selected status
- TP Cleared:** Selected means transport protection was closed. You can't write data to EIS without transport protection closed
- Personalized:** Selected means already written car information, insert working key will activate EIS automatically
- Activated:** Selected means this EIS already have working key. You can't write data to EIS with activated status

### 5.4. EIS Key Information

- Key Password:** Key password use for EIS to recognize working key. It is also the password when prepare key file (IMPORTANT)
- Paste key password:** You can paste your password here directly
- Erase Password:** Renew activated EIS to un-activated status, make EIS allow write new data. Attention: Renew EIS not only need erase password but also key password
- Get erase password:** First read EIS, then press button "Get", get erase password online
- Special Key:** A special key stored in EIS
- Previous used key:** The previous used key in EIS, it is always different from last key
- Last used key:** The last used key in EIS. Example: insert working key with 3, 3, 1, 1: the last used key is 1, the previous used key is 3
- Key 1 – Key 8:** Key track (hash) for every key. Attention: key track is not a fixed value. When you insert a working key to EIS, it's key track will changed. You can verify working key status though this method
- Key used:** Selected means this position have a working key
- Key Disabled:** Selected means this position was disabled, not accept any key. Now we don't support enable key



# 6. Password Calculation

## 6.1. Overview

Password calculation support working key mode and lost all key mode. **WORKING KEY MODE NEED PAY 1 TIME FOR SUCCESS CALCULATION. LOST ALL KEY NEED PAY 2 TIMES FOR SUCCESS CALCULATION**

Password calculation – working key: can get key password through EIS and working key (online)

CAN protocol EIS all support password calculation

Support BGA keys and other NEC keys

Support calculate password for NEC v51, v57 keys. No soldering, safe method.

Data acquisition time depends on the key version. It needs about 3.5 - 13 minutes

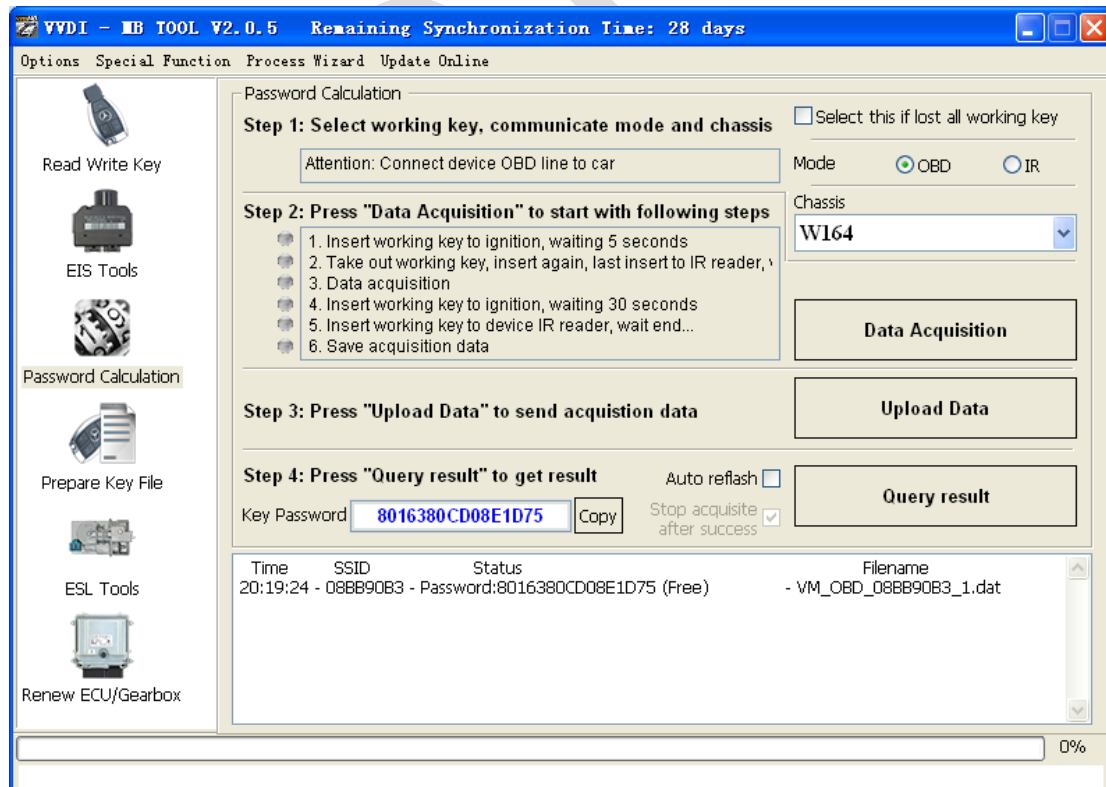
BGA version need about 5 minutes, some versions only need 3.5 minutes

Calculate time in server: 30 seconds – 1 minute

Password calculation – lost all key: support W166, W212, W246, W212(old with ELV) EIS for password calculation while lost all working key

Lost all key data acquisition time depends on EIS type, It needs about 3.5-8 minutes

Lost all key calculate time in server: 30 seconds – 1 minute



## 6.2. Support type

- ◆ Add key support type
  - W164
  - W164 2009-
  - W166, 197, 212, 218, 246
  - W169, 209, 211
  - W172, 204, 207, 212(old with ELV)
  - W216
  - W221
  - W639 2009-
- ◆ Lost all key support type
  - W166, 197, 212, 218, 246
  - W212 (old with ELV)

## 6.3. Functions

**Mode:** OBD and IR adaptor, mode use for communicate with EIS

**Chassis:** Select chassis number, you can detect it with auto detect in EIS Tools

**Data Acquisition:**

Press “Data Acquisition”, it will continue with following steps automatically

1. Insert working key to ignition, waiting 15 seconds
2. Insert working key to device IR reader, verify key and car
3. Data acquisition
4. Insert working key to ignition, waiting 30 seconds
5. Insert working key to device IR reader, wait end...
6. Save acquisition data

**Upload Data:** Upload saved acquisition data to server for calculate password. Attention: Once success calculate password for one SSID, the server will not accept calculate the acquisition data with same SSID in 2 hours. **After 2 hours, acquisition data with same SSID upload to server will start with a new task**

**Query result:** Query server calculation result. The password will fill in key password area automatically after success calculation. Use “Copy” copy password to clipboard

**Auto reflash:** Program will auto re-flash server result until there’s no task for this device. You can start data acquisition once more while auto reflash starting

**Stop acquisite after success:** If you are run data acquisition while auto reflash running, program will stop the acquisition progress when find correct password

## 6.4. About query result status

**Query result support query calculation result in 24 hours, others don't support**

Query result will display Time, SSID, Status, Filename (name when upload to server)

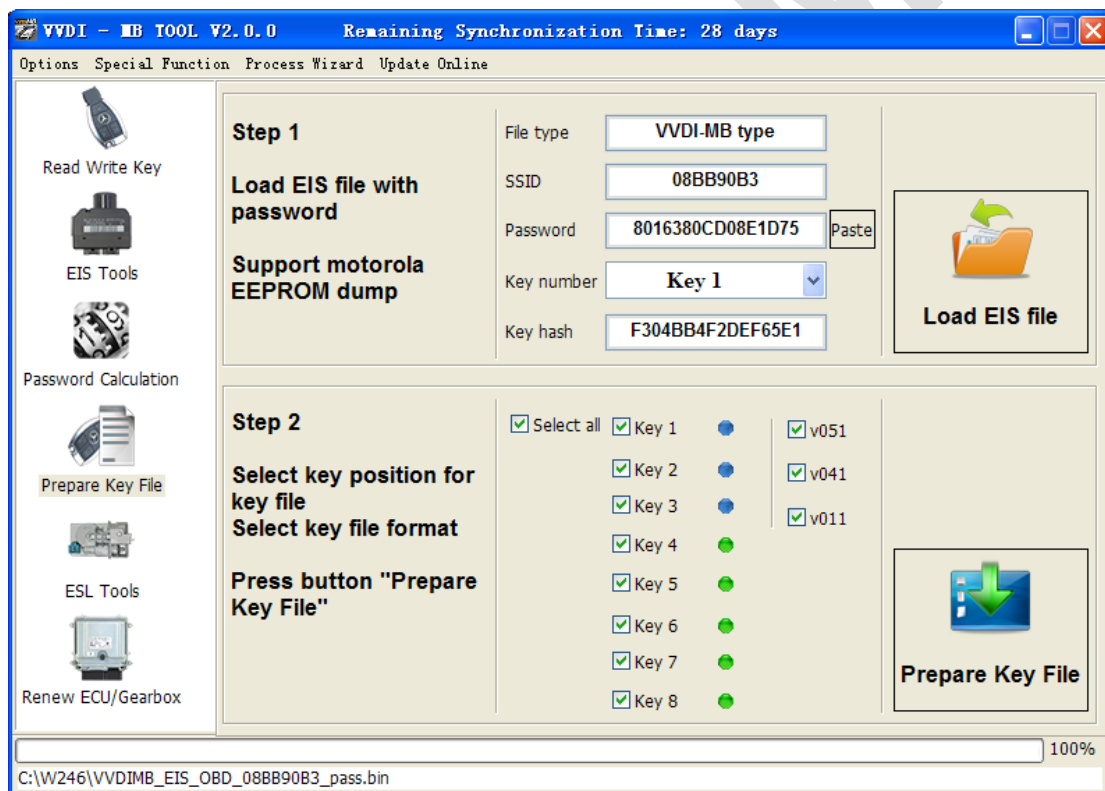
Status has the following types:

1. Queuing: number x, require about y minutes, means your task need y minutes
2. Processing: requires 1 minutes, means your task need 1 minute to finish
3. Password: xxxxxxxxxxxxxxxx (Free), means success find password, "Free" show this task is calculated for free or this task already success calculated before
4. Discard: Once you success calculate the password, in 2 hours, the upload acquisition data with same SSID will discard
5. Already upload: means the server already have this file in queuing
6. Pay for password calculation before upload: means your device doesn't have authorize for calculation. Contact your dealer and pay for password calculation
7. Failed: means this task failed to get password, you can run data acquisition again.  
Failed task is always free

## 7. Prepare Key File

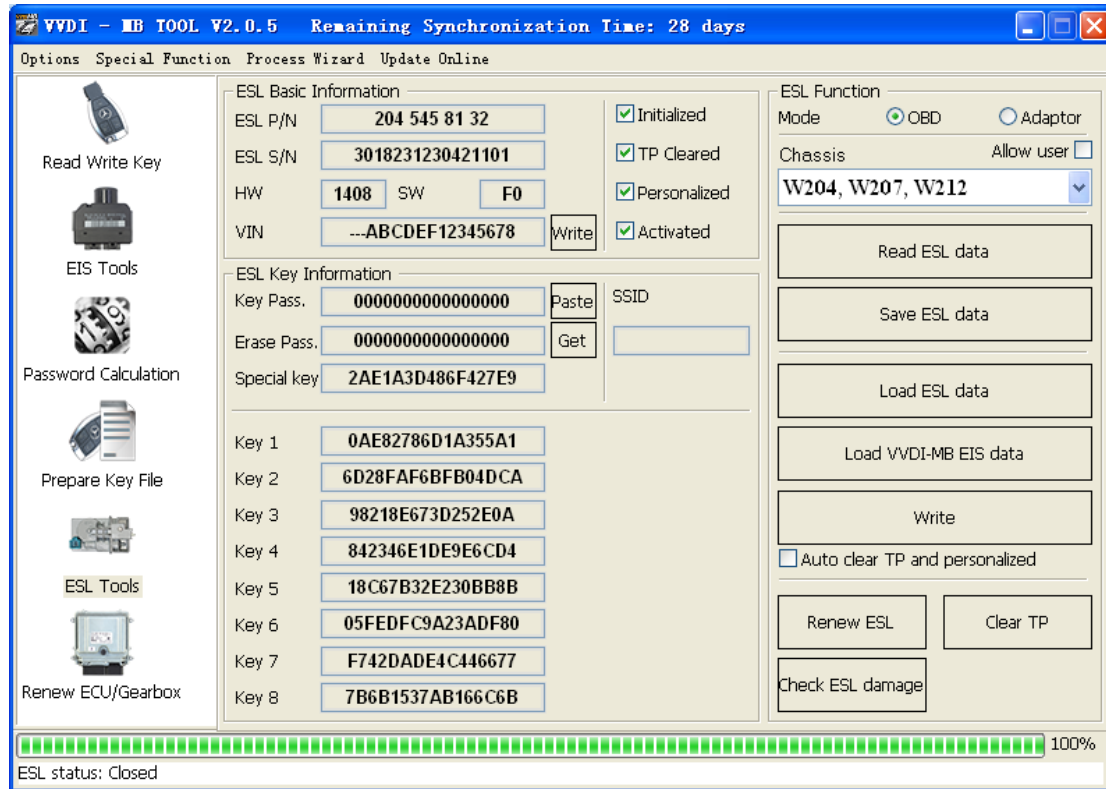
Prepare key file means prepare the key file which you will write to new key (online)

- Step 1: Load EIS file with password. The file can auto detected by VVDI-MB TOOL  
 Support VVDI-MB type and old Motorola EEPROM dump file  
 If the loaded EIS don't contain key password, paste your password with "Paste"  
 After load file key position show blue means it is used  
 After load file key position show green means it is unused  
 After load file key position show gray means it is disabled
- Step 2: Press "Prepare Key File". This function need online, about 20 seconds  
 It will prepare the key file after success find in server  
 After prepare key file, key position show green means success  
 After prepare key file, key position show red means failed



## 8. ESL Tools

ESL Tools can read/write/renew ESL via OBD(K-Line). Adaptor not support now



### 8.1. Functions

1. **Mode:** Now only support OBD (K-Line). If ESL was on car, you need connect the K-Line(find from device OBD head) to ESL separately
2. **Chassis:** ESL type
3. **Allow user:** If select this option, allow input key track, password, VIN manually
4. **Read ESL data:** Read basic information and key information from ESL
5. **Save ESL data:** Save the read ESL data
6. **Load ESL data:** Load ESL data read by VVDI-MB TOOL
7. **Load VVDI-MB EIS data:** Load VVDI-MB type EIS data
8. **Write:** Write the key information (shown in window) to ESL
9. **Auto clear TP and personalized:**  
If you select this option, it will close transport protection and personalized ESL automatically while write data. Attention: Correct key password and EIS SSID should placed with this option
10. **Renew ESL:** Input correct erase password, renew 2<sup>nd</sup> hand ESL to a new one
11. **Check ESL damage:** Most W204 ESL will damage with lock status. You can test it
12. **Clear TP:** Close transport protection in new ESL. The ESL without transport protection closed doesn't support write data

## 8.2. ESL Basic Information

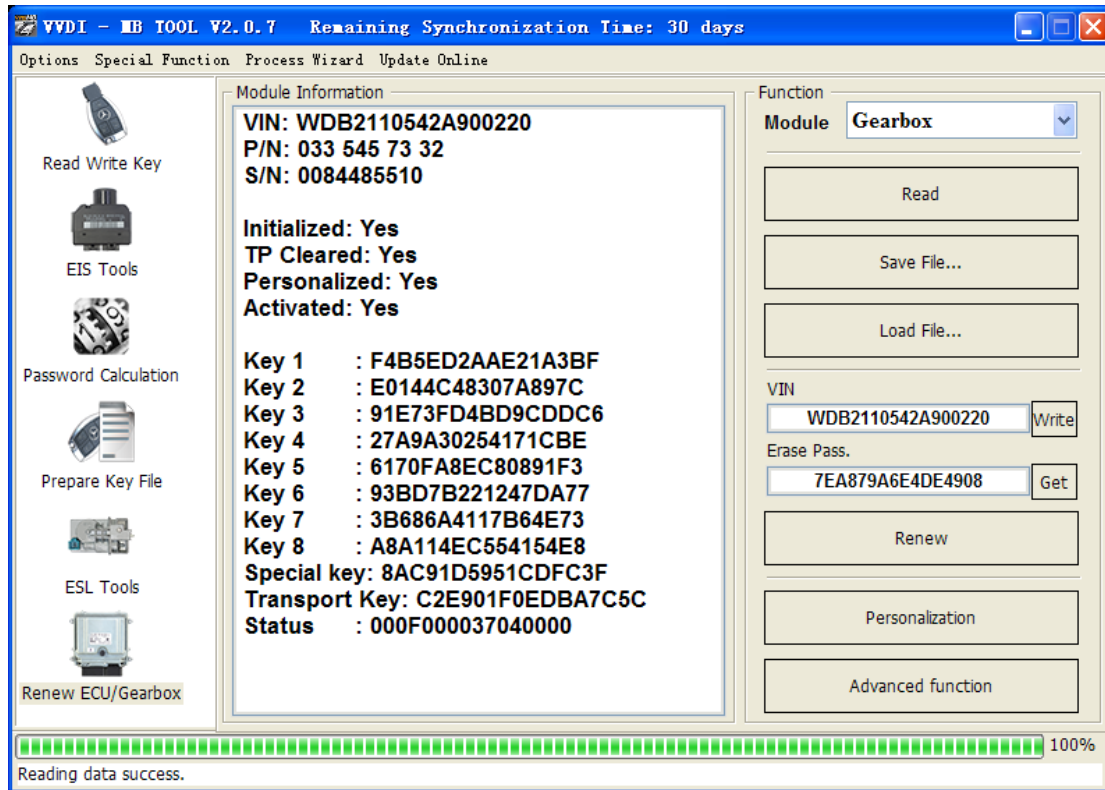
- ESL P/N:** ESL part number, the front 3 characters is the main type, example: W204
- ESL S/N:** ESL serial number
- HW:** ESL hardware version
- SW:** ESL software version
- VIN:** VIN stored in ESL. Attention: only last 14 characters
- Write VIN:** Support write VIN to ESL without activated status
- Initialized:** Selected means ESL was already initialized
- TP Cleared:** Selected means TP was cleared. You can't write data to ESL without TP cleared
- Personalized:** Selected means already written car information, insert working key will activate ESL automatically
- Activated:** Selected means this ESL already have working key. You can't write data to EIS with activated status

## 8.3. ESL Key Information

- Key Password:** Key password use for EIS to recognize working key. It is also stored in ESL
- Paste key password:** You can paste your password here directly
- Erase Password:** Renew activated ESL to new one
- Get erase password:** First read ESL, then press button "Get", get erase password online
- Special Key:** A special key stored in ESL. Normally it is same with EIS special key
- SSID:** You can't read this from ESL. When you write ESL, it need this value
- Key 1 – Key 8:** Key track (hash) for every key. Normally it is same with EIS key track

## 9. Renew ECU/Gearbox

This function support renew, write VIN, personalization operation for module ECU, Gearbox, ISM etc

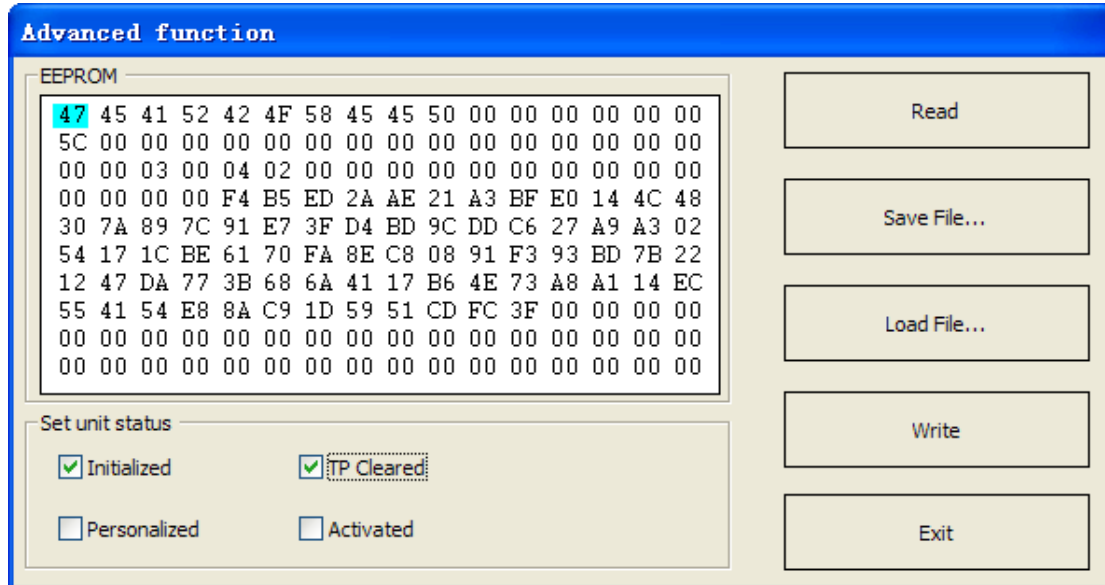


### 9.1. Functions

1. **Module:** Support ECU, Gearbox, ISM etc
2. **Read:** Read key information, unit status and other diagnostic information. Require connect unit with CAN separately
3. **Save File...:** Save the read data to file
4. **Load File...:** Load the saved file
5. **Write VIN:** Write VIN to unit
6. **Get Erase Password:** Get erase password online after success read module information
7. **Renew:** Input correct erase password, renew 2<sup>nd</sup> hand unit to a new one. Require connect unit with CAN separately
8. **Personalization:** Personalize unit to new car. Requires module placed on car
9. **Advanced function:** Only gearbox has this function. Support renew gearbox without erase password, see chapter 9.2

## 9.2. Advanced Functions

Support Read/Write gearbox special EEPROM. Support set unit status while write data. That means you can renew gearbox without erase password



1. **Read:** Read module special EEPROM
2. **Save File...:** Save the read EEPROM file
3. **Load File...:** Load the saved EEPROM file
4. **Write:** Write EEPROM to unit, it will set the selected status to module
5. **Set unit status:** Set unit status, you can set status to unit by write once
  - Set Activated: Will set Initialized, TP Cleared, Personalized, Activated status
  - Set Personalized: Will set Initialized, TP Cleared, Personalized status; not set Activated status
  - Set TP Cleared: Will set Initialized, TP Cleared status; not set Personalized, Activated status
  - Set Initialized: Will set Initialized status; not set Cleared, Personalized, Activated status



## 10. Process Wizard

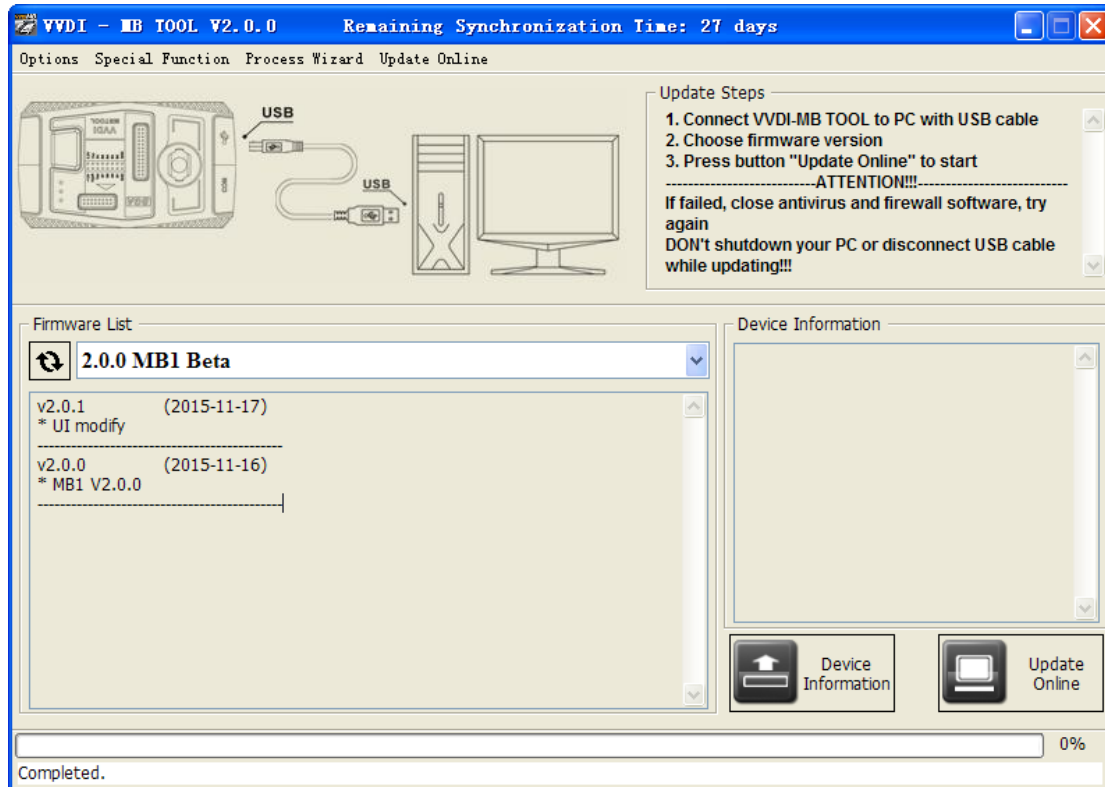
Here will provide whole progress for some special function. Example replace EIS and replace ESL etc (Under developing, it will be released soon!)

## 11. Update Online

### 11.1. Update Firmware

- ◆ The program will read the newest software version from server automatically
- ◆ Update firmware steps:
  - 1) Connect VVDI – MB TOOL to PC with USB cable
  - 2) Choose VVDI – MB TOOL firmware version from Firmware List

- 3) Press button Update Online, wait the progress end
- 4) If failed to get firmware list or get something like “communicate with server error!” while update your device, close antivirus and firewall programs, try again. Change your internet provider once failed again
- 5) DON'T shutdown your PC or disconnect USB cable while update device



### ◆ Reflash Firmware List

Update Online Tool will connect to server automatically and download the newest firmware information. You can press reflash picture button if there's no display.

After you get information success, will display current support firmware list, the software support by specify firmware and the mainly include update information

### ◆ Device Information

After connect VVDI-MB TOOL to PC and install USB drivers, Press button Device Information, will show you VVDI-MB TOOL Serial Number, current firmware version and

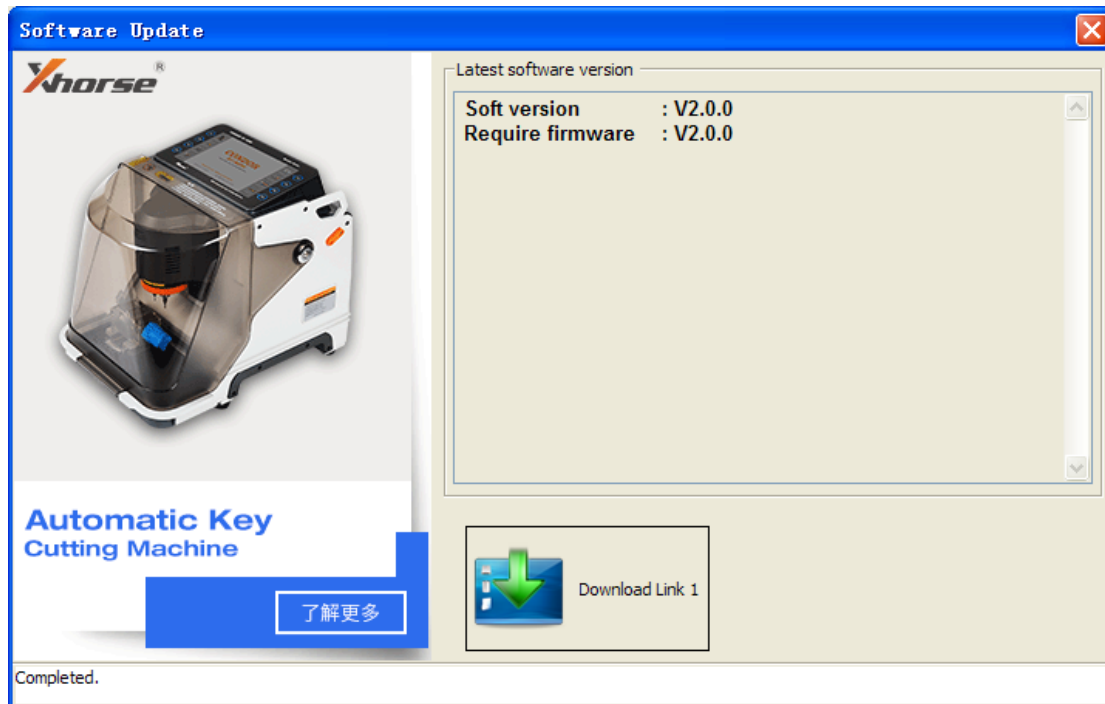
hardware version etc

#### ◆ **Update Online**

After connect VVDI-MB TOOL to PC and install USB drivers, choose you expect firmware version from firmware list, Press button Update Online, wait progress finish (about 3 minutes) (Require internet)

## **11.2. Update software**

- ◆ This function require internet support
- ◆ Use “Menu ->Update Online->Software Update” to obtain VVDI-MB TOOL latest software version, the software version require firmware version etc. Press Download Link will download the latest software
- ◆ If there's no display for software version, shutdown your firewall and antivirus programs, try again



### 11.3. Latest Update Information

- ◆ This function require internet support
- ◆ Use “Menu->Update Online->Latest Update Information” to obtain VVDI-MB TOOL latest update information

### 11.4. History Update Information

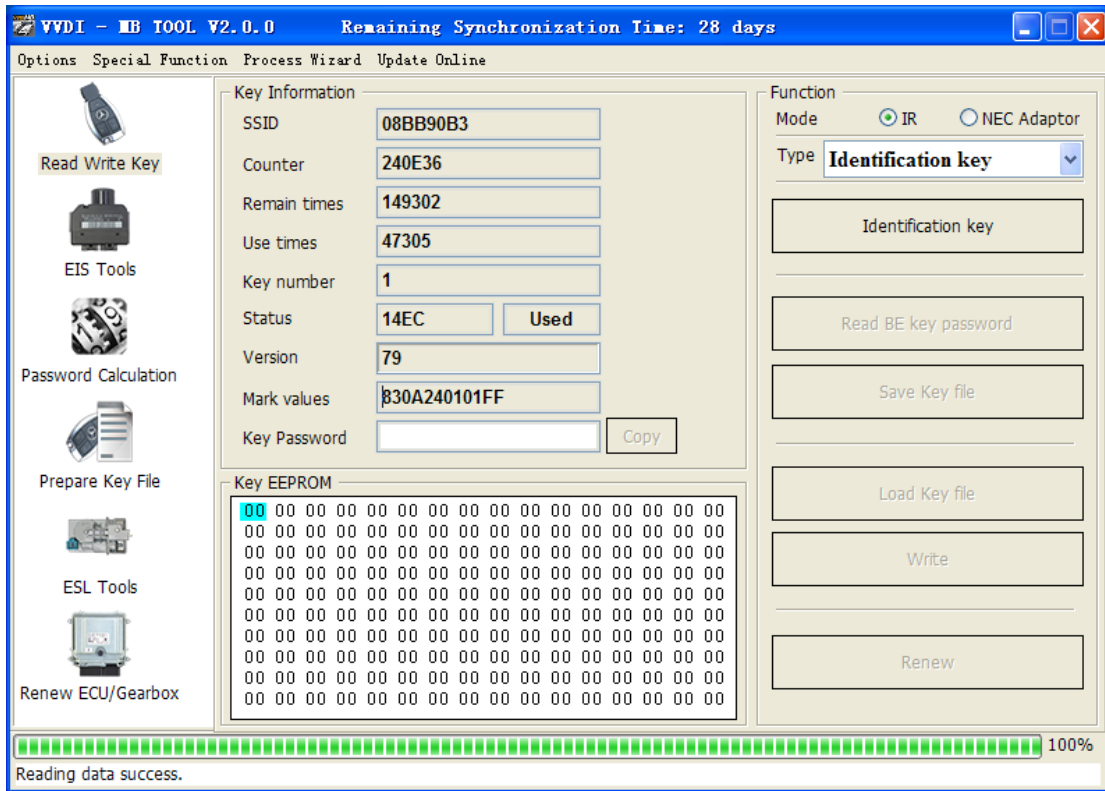
Use “Menu->Update Online->History Update Information” to obtain VVDI-MB TOOL history update information

## 12. Case Description

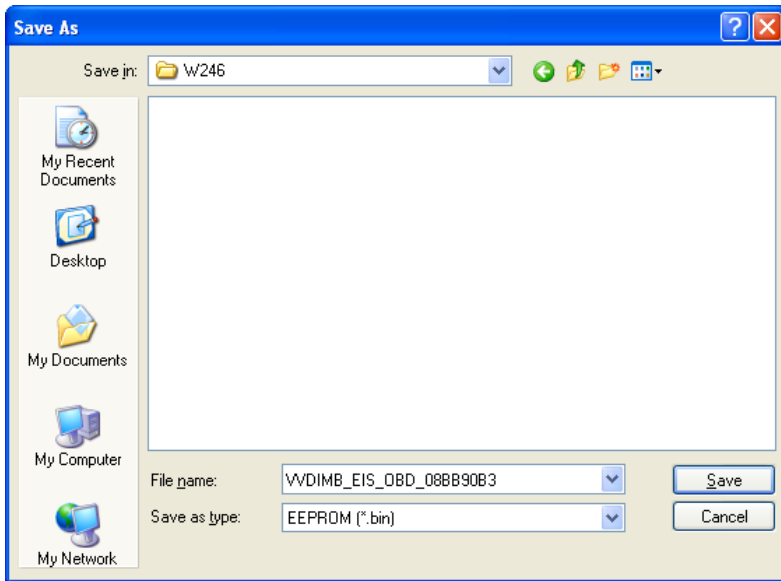
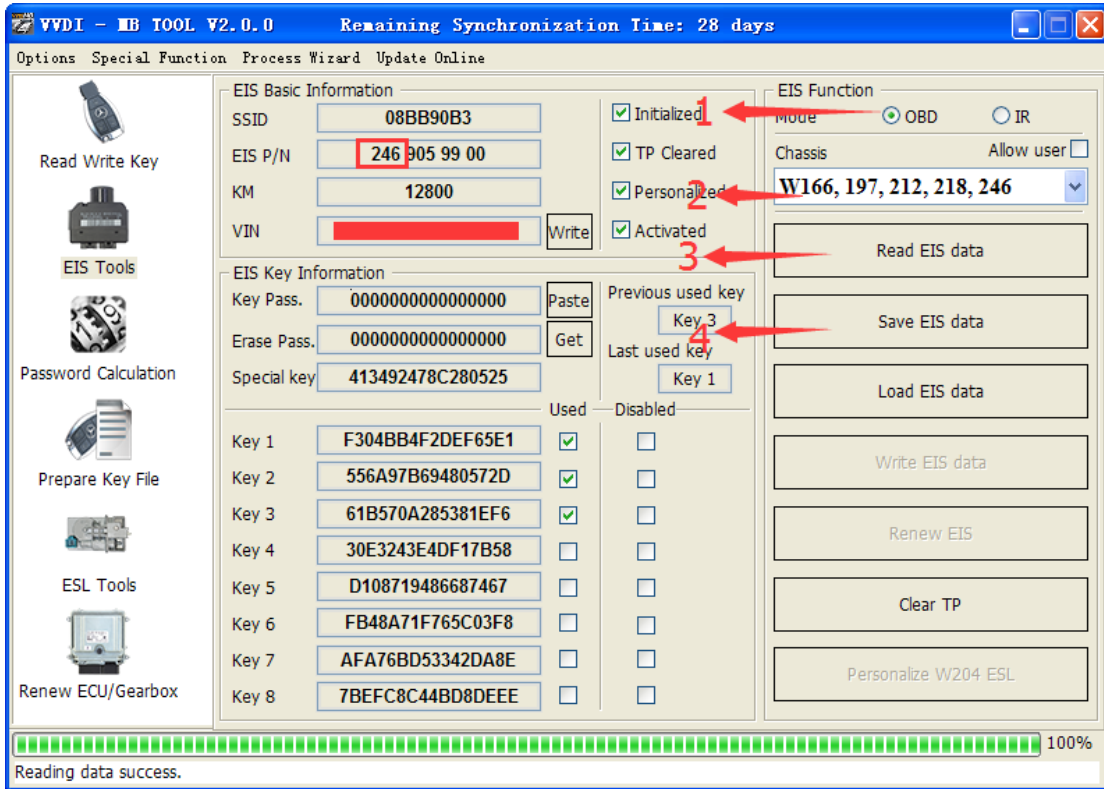
### 12.1. W246 EIS with BGA (79) keys, add new key via OBD

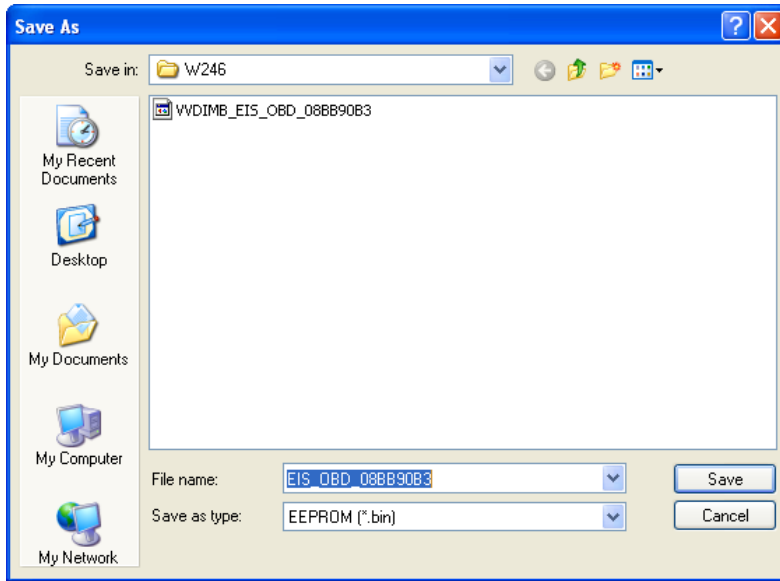
1. Insert working key to device IR reader, Press “**Identification key**”, check working key version
  - ◆ If key with BE version, you can read password via IR
  - ◆ If key with v51, v57 version, you can read password via NEC adaptor, or you can use password calculation
  - ◆ Here key version is 79, belong to BGA key. We use password calculation for key

password

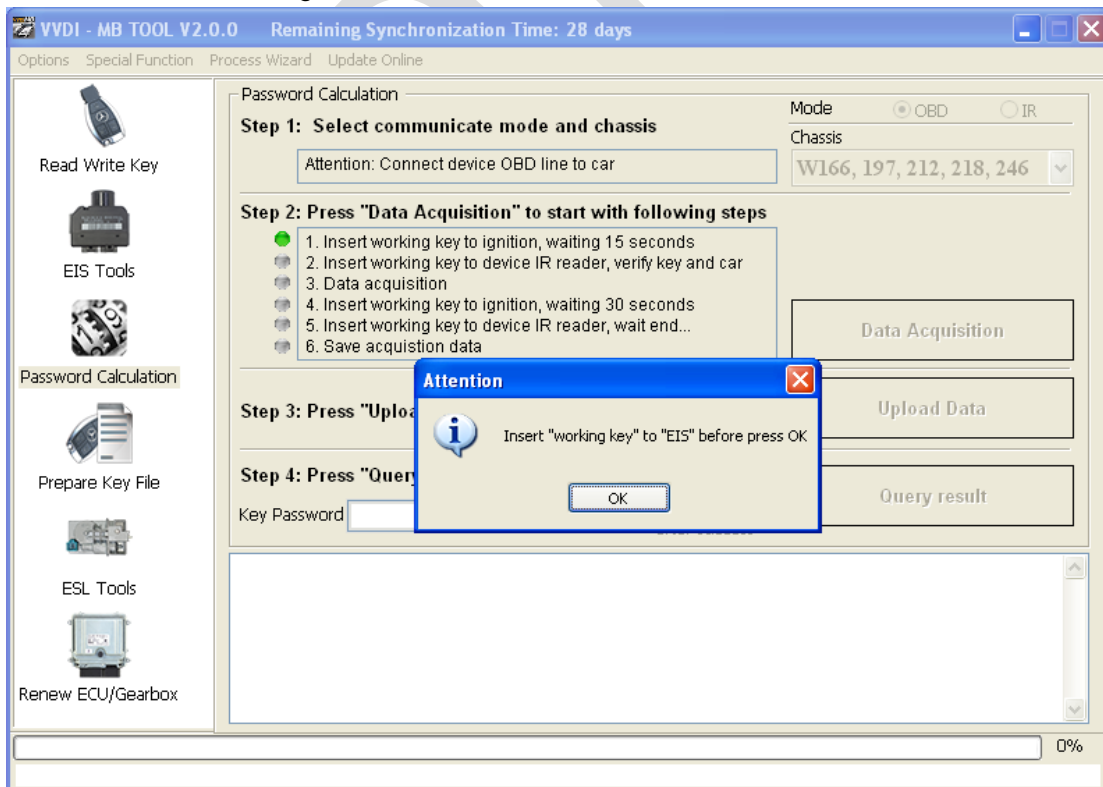


2. Connect device OBD line to car. Select **OB**D mode, chassis select AutoDetect (CAN)
  - ◆ Press **Read EIS data**. Chassis will turn to specify item after success read
  - ◆ Follow steps 1->2->3->4 in picture and save EIS data
  - ◆ It will save 2 files, VVDI-MB type and HC05 type
  - ◆ There's default file name when save EIS data. You'd better keep it



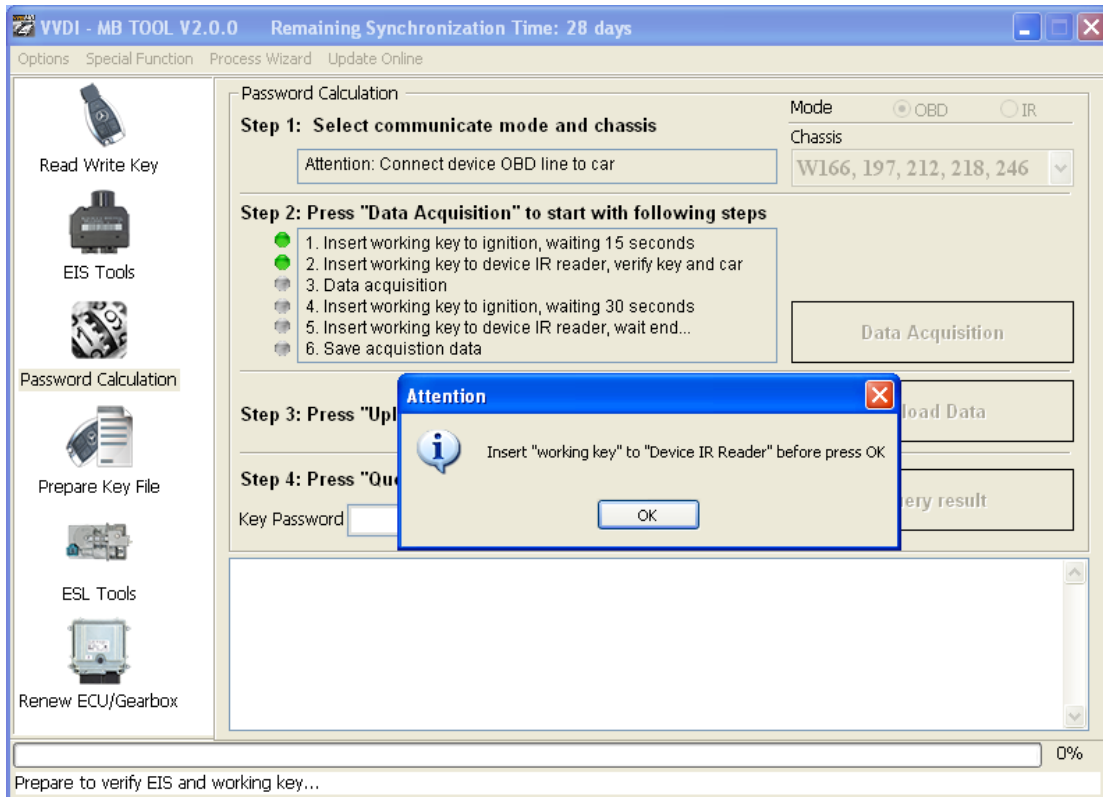


3. Enter **Password Calculation**, calculate key password
  - ◆ Select OBD mode, chassis select W166, 197, 212, 218, 246
  - ◆ Press **“Data Acquisition”**, progress with following steps
  - ◆ Insert **“working key”** to **“EIS”** before press OK; only insert working key to EIS, don't switch ignition ON



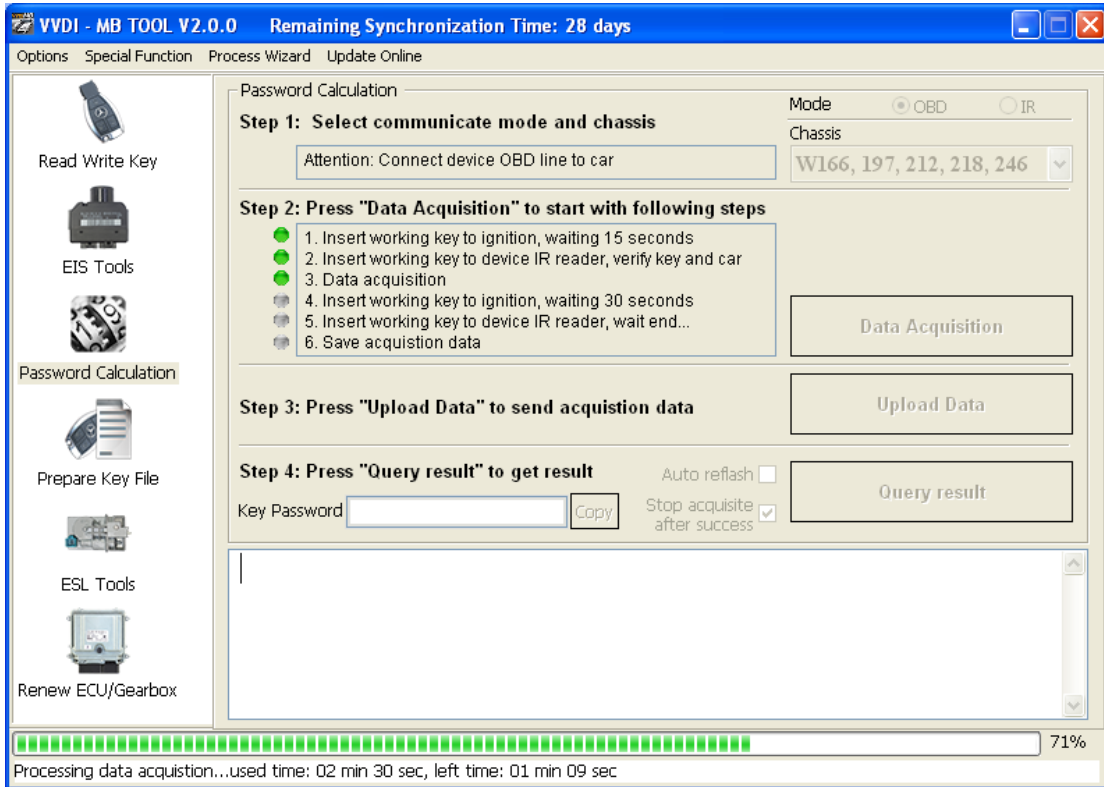
◆ Waiting 15 seconds

◆ Insert “working key” to “Device IR Reader” before press OK; take off working key from EIS and insert to device IR Reader, then press OK

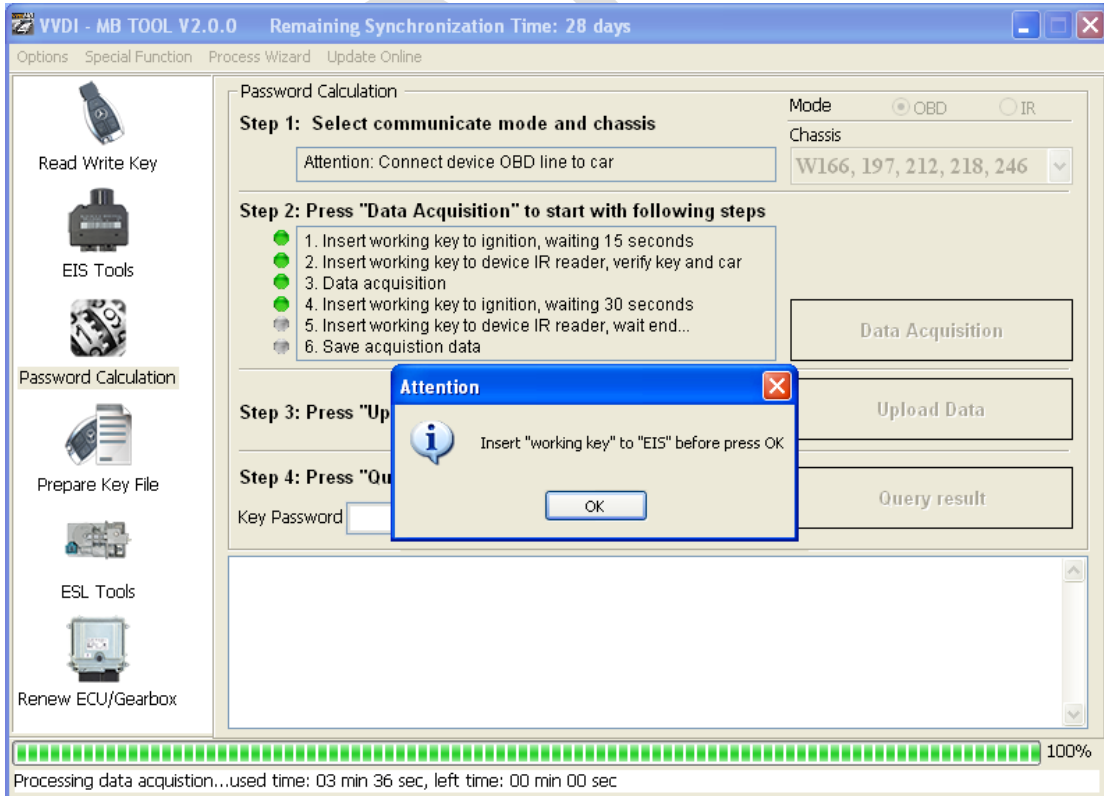




◆ Data acquisition progress, just wait it finish. The left time will show on the bottom

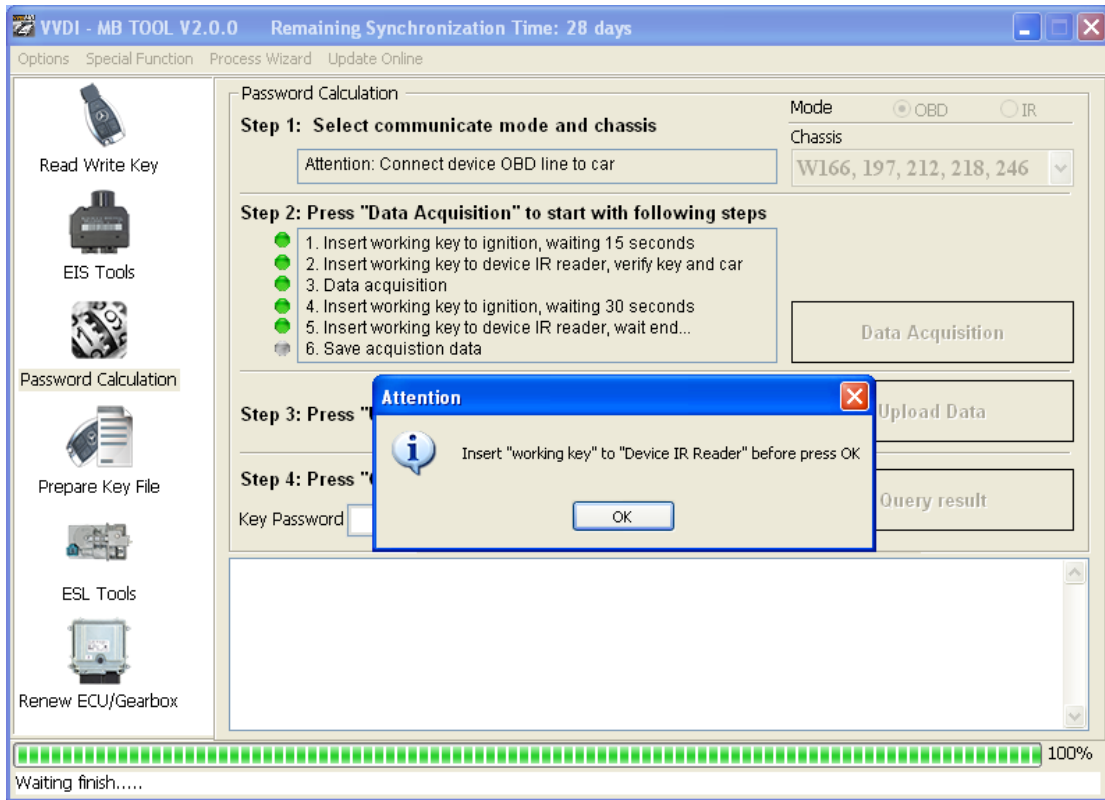


◆ After 100%, Insert “working key” to “EIS” before press OK; only insert working key to EIS, don’t switch ignition ON

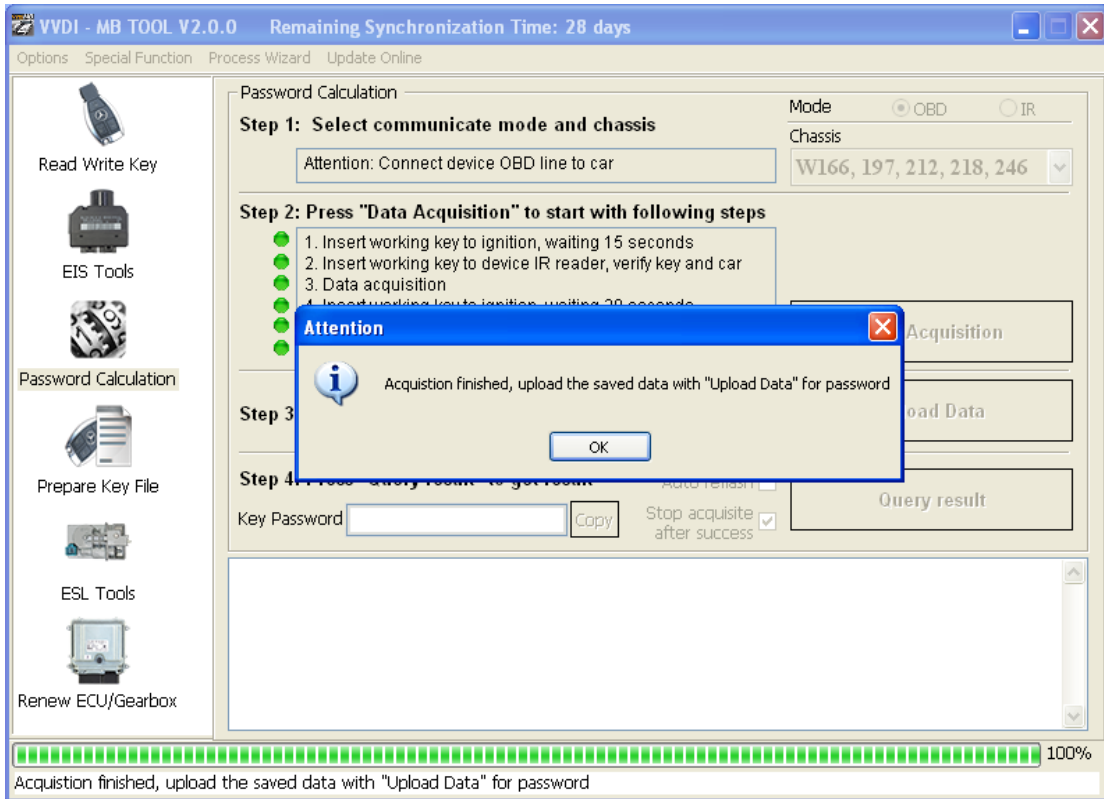


◆ Waiting 30 seconds

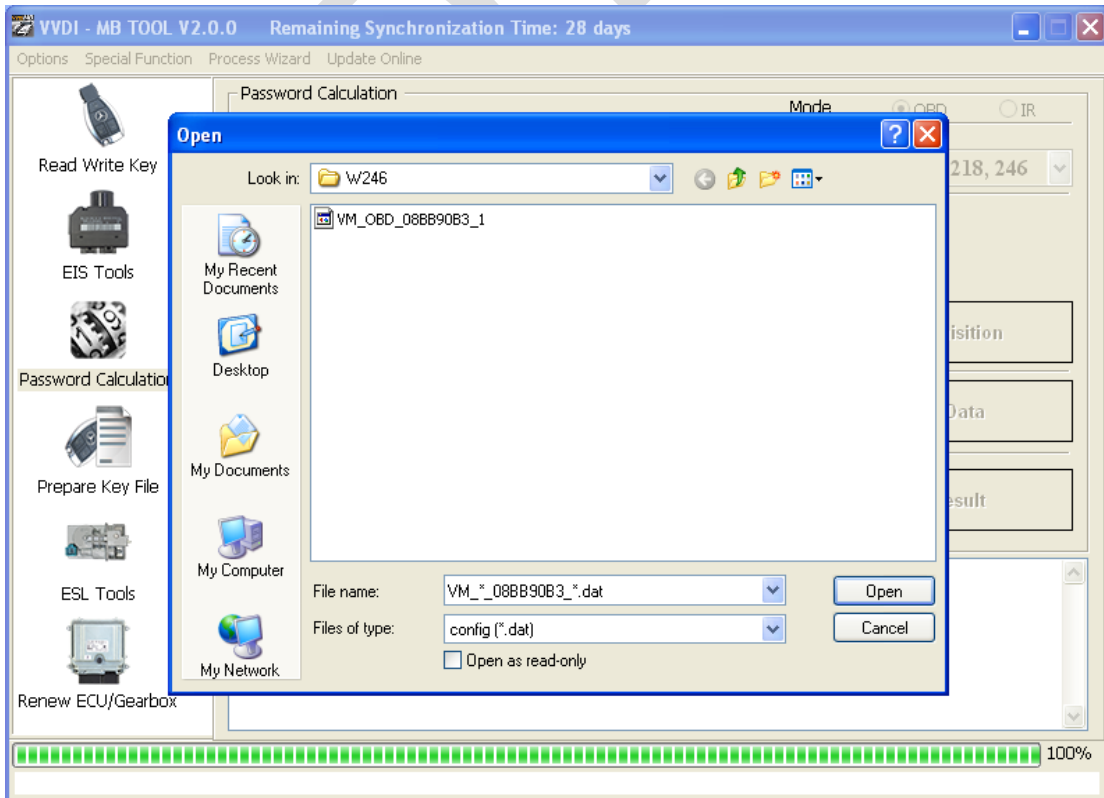
◆ Insert “working key” to “Device IR Reader” before press OK; take off working key from EIS and insert to device IR Reader, then press OK



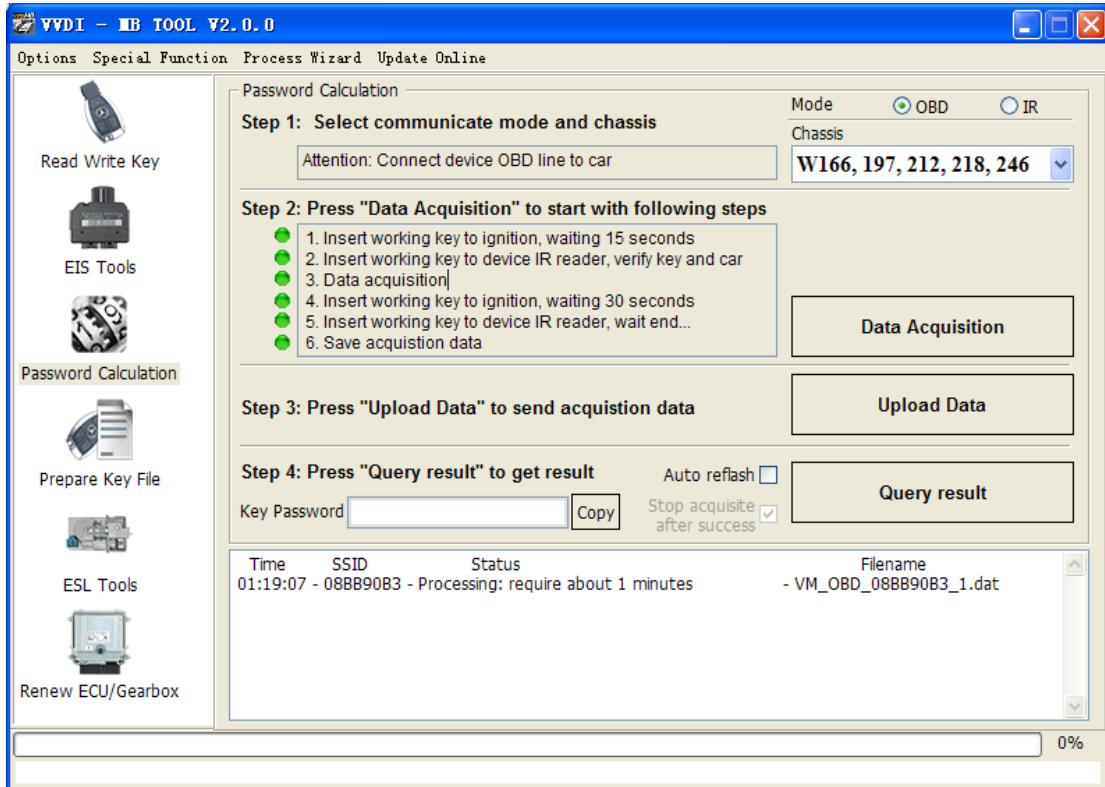
- ◆ After save acquisition data you will get next window. Please keep the default file name when save acquisition data



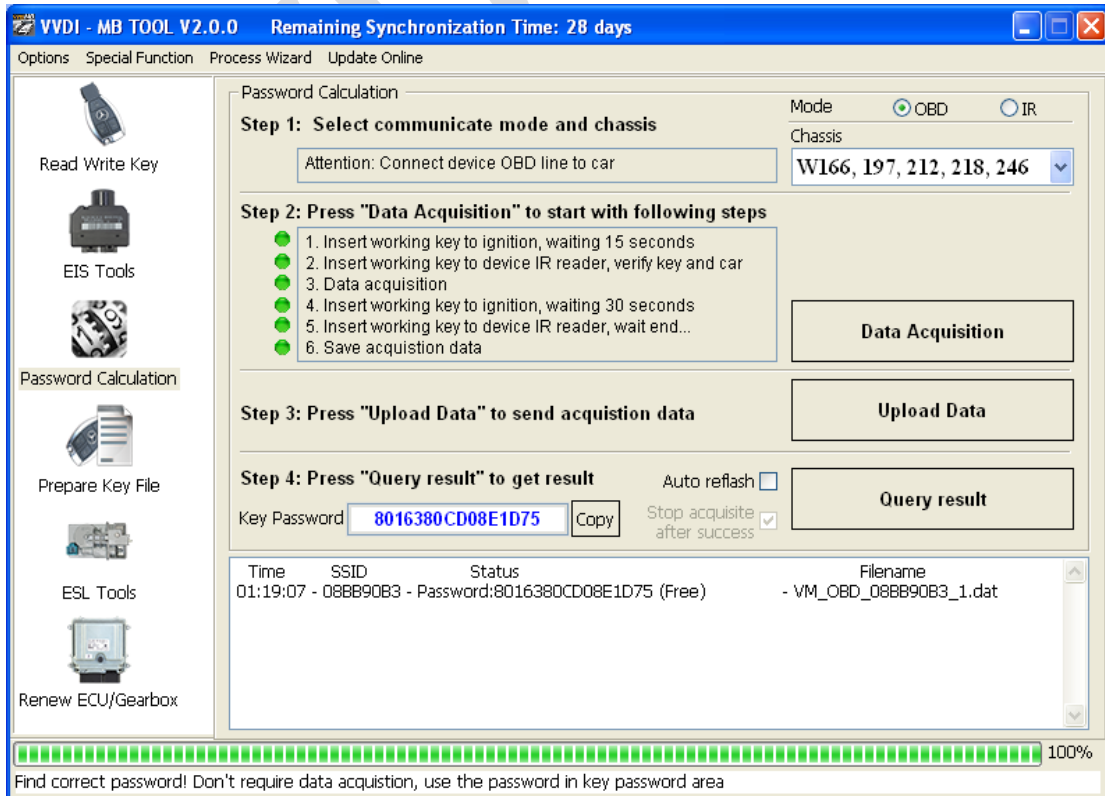
- ◆ Press **Upload Data** to upload saved acquisition data to server



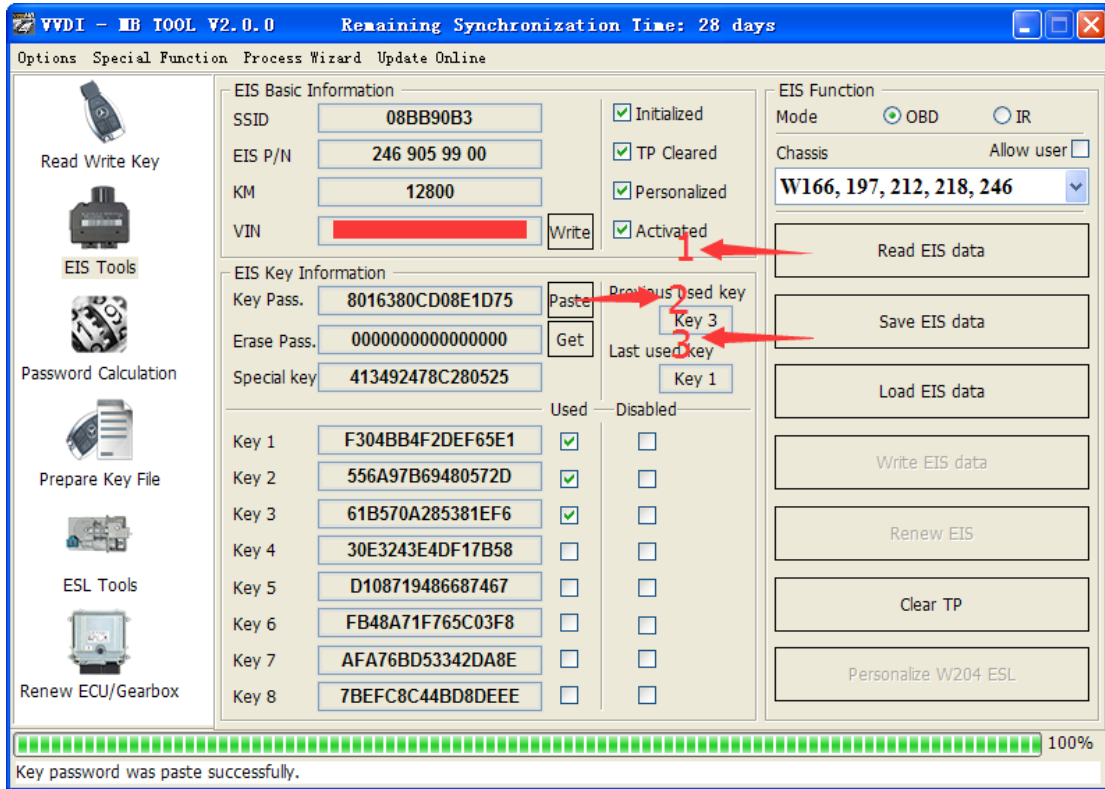
- ◆ Press **Query result** to get result, you can select “**Auto reflash**”, it will query server result automatically, it need about 1 minute



- ◆ After calculate success, key password will display at key password area automatically, press “**Copy**” copy the password to clipboard

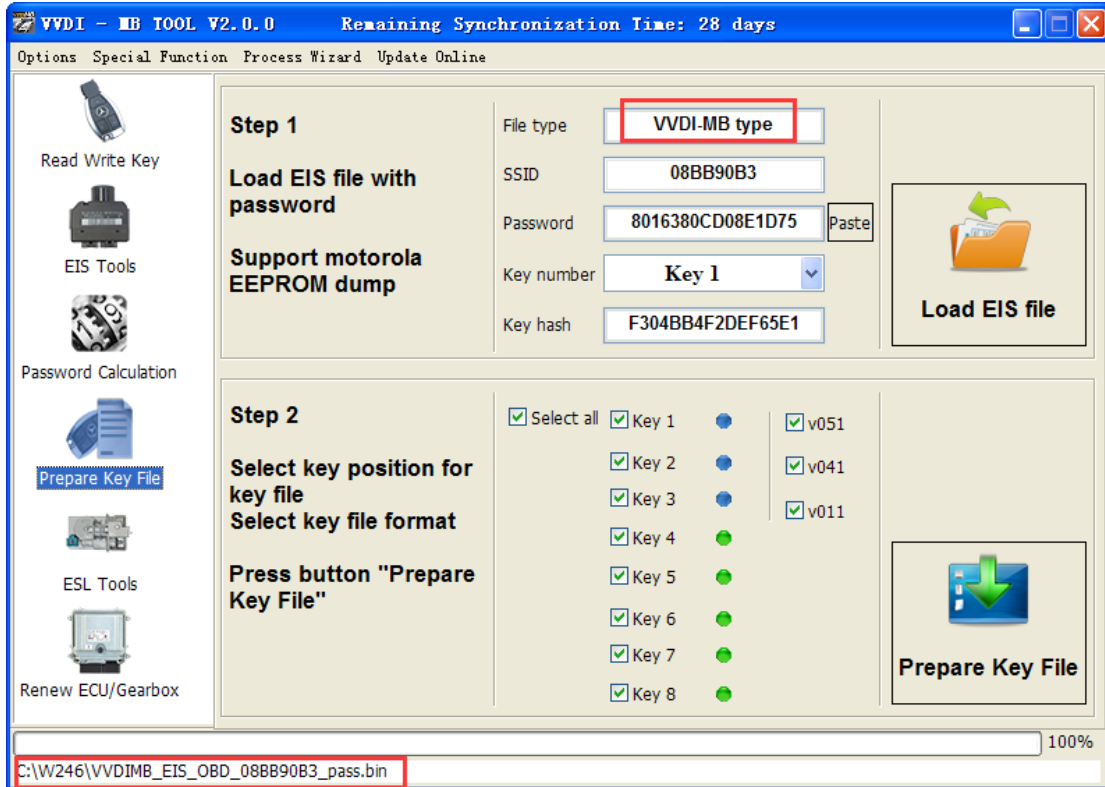


4. Save EIS data with password
  - ◆ Enter **EIS Tools** again
  - ◆ Read EIS data
  - ◆ Use **“Paste”** paste the password to key password area
  - ◆ Then save EIS data again
  - ◆ Steps: 1->2->3

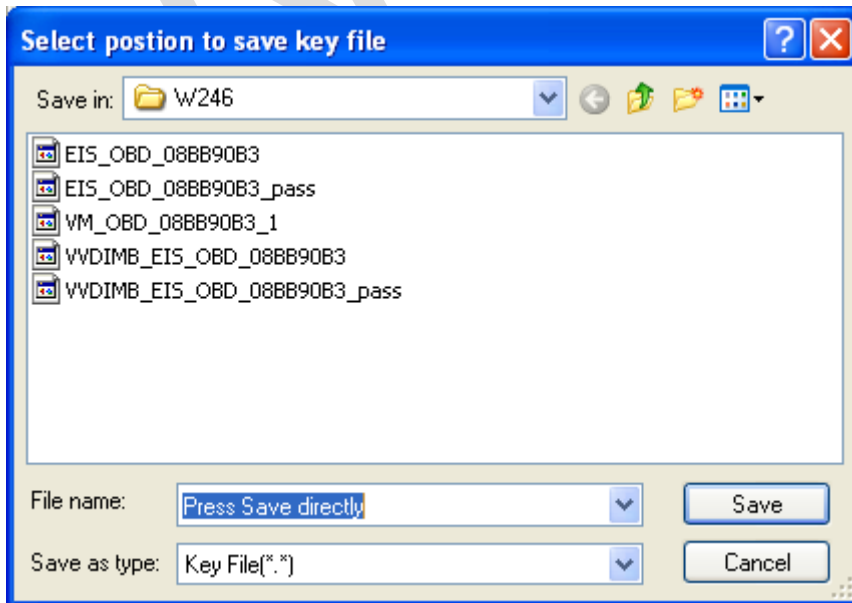


5. Enter **Prepare Key File**

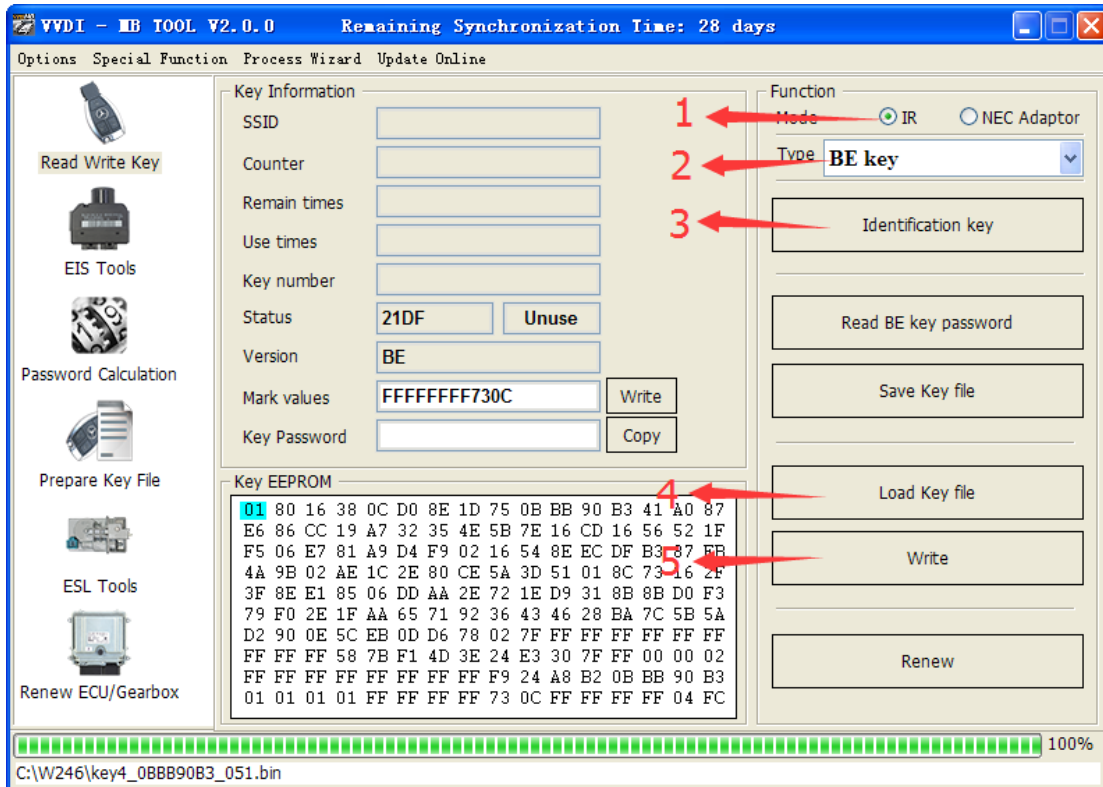
- ◆ Press **Load EIS file** load EIS data with password
- ◆ The file path will be shown at bottom
- ◆ VVDI-MB TOOL will auto detect load file type, here is VVDI-MB type
- ◆ SSID and key password was shown



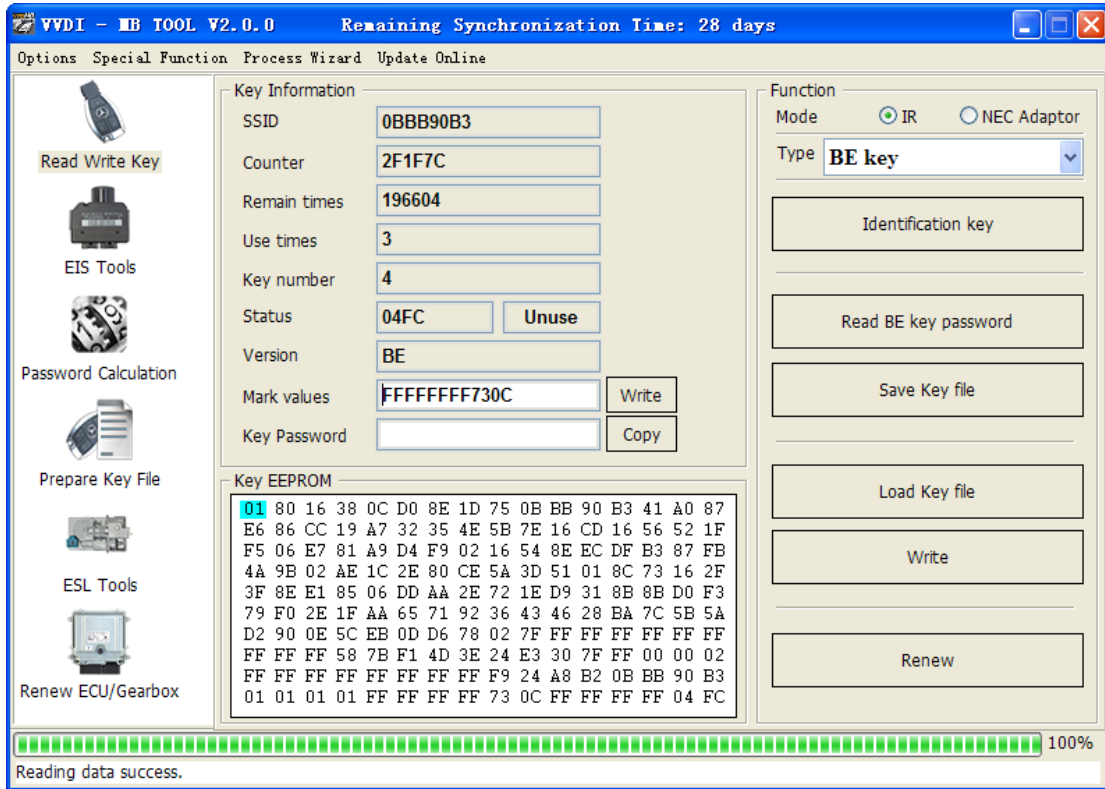
- ◆ Select key position and format for key file, Press **Prepare Key File** (online)
- ◆ After server find success, select where you want to save the key file, press save directly



6. Enter **Read Write Key**. If you want Keyless Go, please select NEC adaptor
  - ◆ We make a BE key.
  - ◆ Input BE key to device IR reader, select IR mode and BE key
  - ◆ Press **Identification key**
  - ◆ **Load Key file**, we load key 4
  - ◆ Press **Write**
  - ◆ Steps:1->2->3->4->5



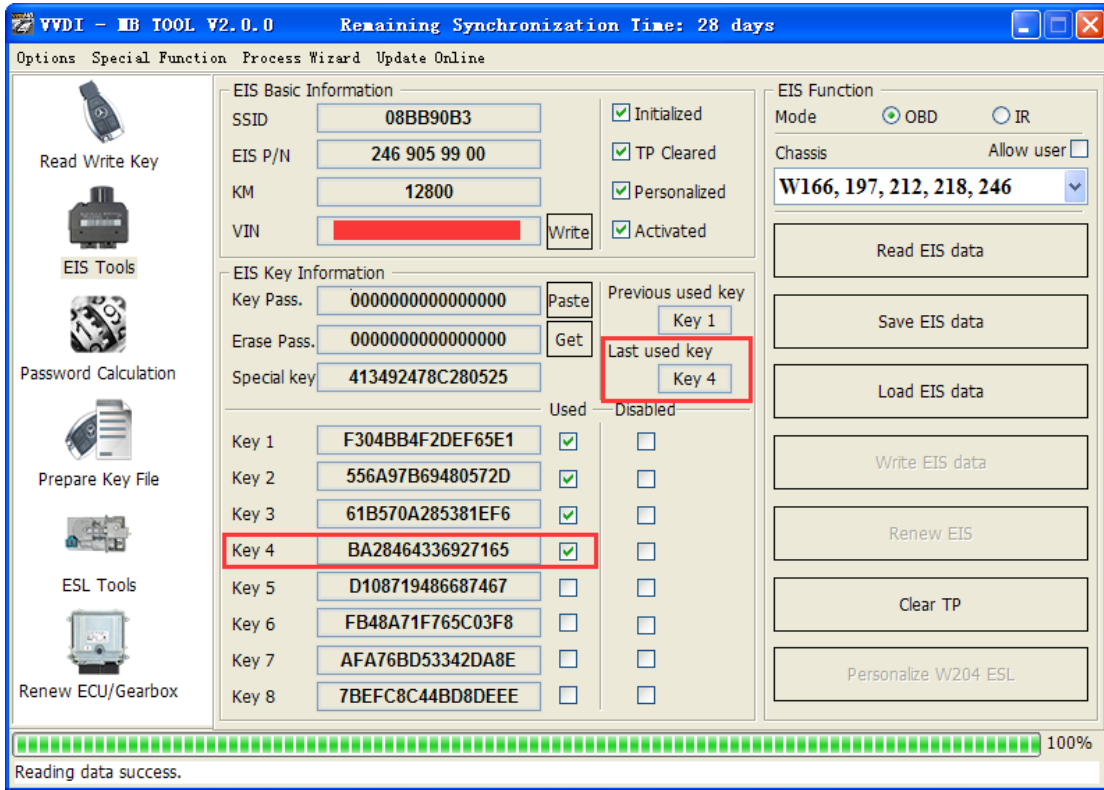
- ◆ Press **Identification key** again after write key file. You can see key is prepared **SUCCESS**



VVDI



7. Insert new key to EIS, the EIS will learn the new key
  - ◆ First the red light will ON , then OFF, means key learn success
  - ◆ Read EIS data once more, you can find key 4 was selected



8. Completed.

