

# Maxi-K

Installation and user manual 1.16

English



## 1 INTRODUCTION

The Maxi-K unit is used for extension of maxidot functions. It was primarily built for Skoda Octavia 1U, but it works also on VW Golf IV, Bora, Passat B5, B5.5, Sharan II, Skoda Superb I, Seat Leon, Toledo 1M, Ford Galaxy WGR, Seat Alhambra and Audi A3 8L, A6 C5 and A4 B5 only with VDO Instrument clusters.

Unit not works on Fabia I and other next generation vehicles like Skoda Octavia II, VW Golf V, etc.

Maxi-K can make basic diagnostic functions like reading trouble codes and reading measurement values. It only supports the KW1281 diagnostic protocol and 3-line bus protocol to communicates with MaxiDot display.

Maxi-K is controlled by the right boardcomputer lever, so it can be instaled hidden under the instrument cluster.

Maxi-k has two user modes. In boarcomputer mode, it shows preprogrammed values, which can be read from vag-com. In this mode, it is emulating the 3-line bus radio.

In menu mode, the Maxi-K is emulating 3-line bus navigation. To switch to the menu, you must press and hold the RES button and click to DOWN button. After lets both button, the Maxi-K will show the main menu. To listing in the menu, you can press DOWN button, to confirm selected item, press RES button (UP button on Audi vehicles).

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## 2 SAFETY WARNING:

This manual has only information character and all informations are without warranty. Always is necessary to confirm concrete wiring for your vehicle.

Instalation of Maxi-K unit should be maked by an electrician. All connections must be soldered and must have very good insulation to prevent electric shorts.

Controlling of Maxi-K unit can distract the driver attention. Always be careful when you control the maxi-k and think first on your safety.

The Maxi-K unit will make on your order and each piece is original, so it is not approved to use on the road.

The manufacturer bears no responsibility for any damage caused by improper installation or using of Maxi-K in a vehicle

### 3 Delivery contents:

- Interface Maxi-K
- Cable set 50cm 9 x 0.22mm ("Radio" version 12 x 0.22mm)



#### Requirements:

- FIS instrument cluster with 3-Line BUS (pins ENA, DATA, CLOCK)
- support KWP1281 protocol, KWP2089 not yet supported!
- For Maxi-K version "Radio" is also needed the radio with 3-line bus communication (For example VW MFD type D, Skoda DX type A, Skoda symphony CD type A,B,C, etc..) CAN-Bus radios are not supported!! (For example Skoda DX type B, C - with TMC box, Skoda Symphony CD type D, E, F, etc..)

#### Installation:

On vehicles with original CAN-Bus radio or navi installed, you must recode radio/navi to non-CAN-Bus mode or you can disconnect the radio from comfort-CAN-Bus. Correct code can be found in service manual.

Also If there is multifunction steering wheel and original CAN radio/navi, it is necessary to recode the multifunction steering wheel ECU to non-CAN mode and make connection between this ECU and original radio/navi (pin 5 on steering wheel ECU and pin 11 in green mini-ISO connector on radio/navi). Otherwise radio remote from steering wheel will not work.

Not all radios support this remote, for example Skoda Rhapsody support only remote via CAN-bus. So If you have this radio and multifunction steering wheel, you must forgot on remote control, if you want install Maxi-K.

Now you can install maxi-k by following these steps:

- disconnect the car battery
- remove the instrument cluster
- connect Maxi-k cable set to vehicle as shown in table. T32a is blue connector and T32b is green connector, T32c is Gray Audi connector and T20 is small Black connector, which is only on some types of intruments.
- This table is for vehicles VW, Ford, Seat and Skoda with CAN-bus IMMO3 instrument clusters with two 32pins connectors (1U0 920 841..., 1J0 920 846..., 3B0 920 847..., 3U0 920 840... etc.).

Pin	Function:	Connect to:	Cable color Maxi-K
1	Switched +12 V	Blue connector T32a/1	Red
7	GND	Blue connector T32a/9	Black
2	K – Line	Blue connector T32a/25	Blue
8	CLOCK IN	Radio / Navi CLOCK*	White twisted 2*
3	ENA IN	Radio / Navi ENA*	Red twisted 2*
9	DATA IN	Radio / Navi DATA*	Black twisted 2*
4	MFD DOWN	Green connector T32b/24	Yellow
10	Reverse light	Only for cars witch genuine park. assist.	Brown
5	MFD RES	Green connector T32b/25	Green
11	CLOCK OUT	Green connector T32b/30*	White twisted 1
6	DATA OUT	Green connector T32b/31*	Black twisted 1
12	ENA OUT	Green connector T32b/32*	Blue twisted 1

- This table is for VW with CAN-bus IMMO2 instrument clusters (1J0 920 842..., 1J0 920 845..., 3B0 920 842..., etc..) and VW with non-CAN-bus instrument clusters (1J0 919....., 3B0 919....., etc.).

Pin	Function:	Connect to:	Cable color Maxi-K
1	Switched +12 V	Blue connector T32a/1	Red
7	GND	Blue connector T32a/9	Black
2	K – Line	Blue connector T32a/25	Blue
8	CLOCK IN	Radio / Navi CLOCK*	White twisted 2*
3	ENA IN	Radio / Navi ENA*	Red twisted 2*
9	DATA IN	Radio / Navi DATA*	Black twisted 2*
4	MFD DOWN	Green connector T32b/24	Yellow
10	Reverse light	Only for cars with genuine park. assist	Brown
5	MFD RES	Green connector T32b/25	Green
11	CLOCK OUT	Black (Red female) connector T20/12*	White twisted 1
6	DATA OUT	Black (Red female) connector T20/13*	Black twisted 1
12	ENA OUT	Black (Red female) connector T20/15*	Blue twisted 1

- This table is for Audi with non-CAN-bus instrument clusters (4B0 919....., 8L0 919....., etc.) Not for Audi Magnetti - Marelli JAEGER!!

Pin	Function:	Connect to:	Cable color Maxi-K
1	Switched +12 V	Blue connector T32a/1	Red
7	GND	Blue connector T32a/9	Black
2	K – Line	Blue connector T32a/25	Blue
8	CLOCK IN	Radio / Navi CLOCK*	White twisted 2*
3	ENA IN	Radio / Navi ENA*	Red twisted 2*
9	DATA IN	Radio / Navi DATA*	Black twisted 2*
4	MFD DOWN	Black (Red female) connector T20/18	Yellow
10	MFD RES	Black (Red female) connector T20/11*	Brown
5	MFD UP	Black (Red female) connector T20/14	Green
11	CLOCK OUT	Black (Red female) connector T20/12*	White twisted 1
6	DATA OUT	Black (Red female) connector T20/13*	Black twisted 1
12	ENA OUT	Black (Red female) connector T20/15*	Blue twisted 1

- This table is for Audi with CAN-bus instrument cluster (4B0 920 ....., 8L0 920....., etc). Not for Audi Magnetti - Marelli JAEGER!!

Pin	Function:	Connect to:	Cable color Maxi-K
1	Switched +12 V	Blue connector T32a/1	Red
7	GND	Blue connector T32a/9	Black
2	K – Line	Green connector T32b/28	Blue
8	CLOCK IN	Radio / Navi CLOCK*	White twisted 2*
3	ENA IN	Radio / Navi ENA*	Red twisted 2*
9	DATA IN	Radio / Navi DATA*	Black twisted 2*
4	MFD DOWN	Gray connector T32c/18	Yellow
10	MFD RES	Gray connector T32c/19*	Brown
5	MFD UP	Gray connector T32c/17	Green
11	CLOCK OUT	Gray connector T32c/12*	White twisted 1
6	DATA OUT	Gray connector T32c/13*	Black twisted 1
12	ENA OUT	Gray connector T32c/11*	Blue twisted 1

Make only soldered wiring!!

It is not necessary to connect signal from reverse light, if you don't have original parking assistant, or if you don't want to use parking assistant function on Maxi-K. The reverse light cable can be found on the left under the dashboard in A-column.

\* Only for Maxi-K version "Radio"

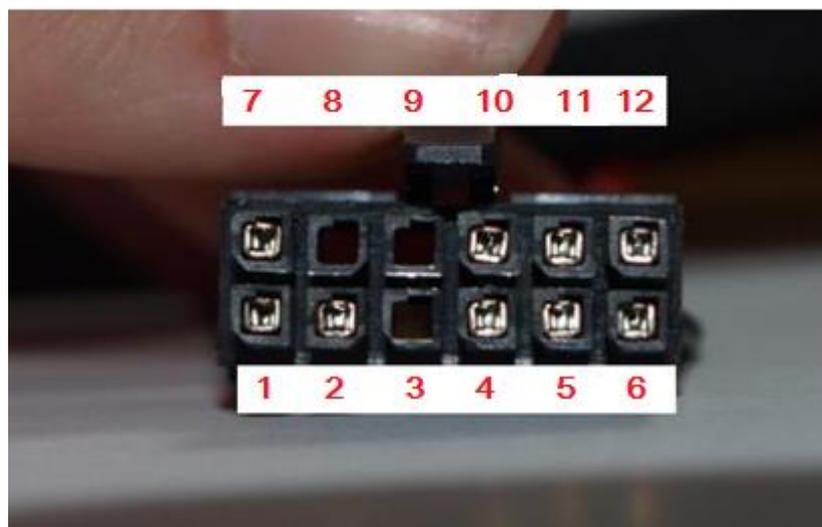
\* If there is some connected cable, it must be disconnect. There must be only cables from Maxi-K, otherwise the Maxi-K unit may be damaged. These cables can be fitted on vehicles, which have original 3-line bus radio or navi, or on vehicles, which is not equipped by FIS dashboard from factory.

\* On Audi vehicles, the short press of RES button turns off the maxidot display. So the Maxi-k is switched to the menu by current long press of RES button and short press of DOWN button. This is the only function, which the RES button has. Instead of RES button on all other controlling, the UP button is used (confirmations in the menu).

On all vehicles, the coding of instrument cluster must be over 16000. If it is less, add 16000 to current code and recode the instrument cluster. On Audi CAN, it is also necessary to save value "0" to adaptation channel 62.

**WARNING!!** In Maxi-K cable set are two black and two white cables (three on version "Radio"). Twisted tree cables (Blue, Black and White) must be connected to pins ENA, DATA and CLOCK to instrument cluster (OUT). twisted Red, White and Black is for ENA, DATA and CLOCK form Radio (IN).

- Install instrument cluster, pull out the Maxi-K connector. It is necessary to measure voltage on all pins on Maxi-K connector, while ignition is turned on.
- Connect the car battery
- Turn the ignition on. Measure pins on Maxi-K connector. Pin numbers are shown on following picture



- You must measure voltages, as shown in the following table.

Pin	Function:	Voltage	Cable color Maxi-K
1	Switched +12 V	~ +12V	Red
7	GND	0V	Black
2	K – Line	~ +12V, but less then on pin 1	Blue
8	CLOCK IN	Max +5V when radio on*	White twisted 2*
3	ENA IN	Max +5V when radio on*	Red twisted 2*
9	DATA IN	Max +5V when radio on*	Black twisted 2*
4	MFD DOWN	+12V; 0V when pressing button	Yellow

10	Reverse light	0V, +12V on reverse gear*	Brown
5	MFD RES/UP*	+12V; 0V when pressing button	Green
11	CLOCK OUT	+5V	White twisted 1
6	DATA OUT	+5V	Black twisted 1
12	ENA OUT	0V	Blue twisted 1

\* Only on Maxi-K "Radio" version.

\* UP on Audi vehicles, RES on other vehicles

\* RES button on Audi vehicles, +12V and 0V when pressed,  
Pay attention when measuring pins 3,8,9,6, 11 and 12. Voltage higher than +5V can damage Maxi-K unit!! If you measure higher voltage, never attach connector to Maxi-K unit!! Cables are not connected correctly

- If everything is Ok, disconnect the car battery and remove instrument cluster
- Choose the suitable place for fixing Maxi-K unit (for examples you can visit gallery on [www.maxi-k.cz](http://www.maxi-k.cz))
- Fix the unit and attach connector
- Install instrument cluster
- Connect the car battery
- Then turn the ignition on. If Maxi-K not started on FIS, on VW or Skoda vehicles, recode the Gateway unit by VAG-COM with the same code, which it was coded. This will reset instrument cluster to 3-line bus mode. Now turn the ignition off
- After 30 seconds, turn the ignition on. Now Maxi-K must start.

## 4 User manual

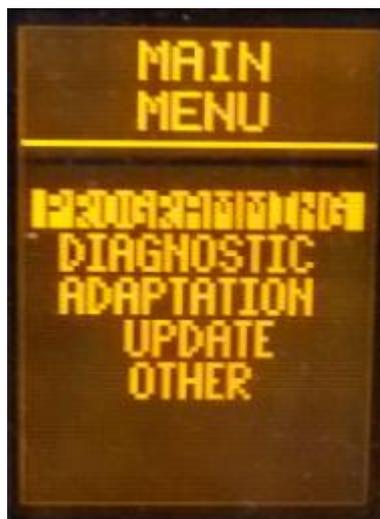
After successfully installation and turning the ignition on, the Maxi-K will display preprogrammed eblem. You can draw your own eblem, if you want. See the rules of drawing your own eblem. Eblem also can be changed later.



New unit doesn't have preprogrammed values, so it is necessary to program values, which are interesting for you.

To program unit, you must turn Maxi-K unit to menu. So press and hold the RES button and then click to DOWN button. After lets both button, Maxi-K will show the main menu. (Also for Audi vehicles)

### 4.1 Main menu in version 1.18



You can listing in the menu by press the DOWN button. To confirm selected item, press RES button (UP button on Audi).

Main menu has five basic possibilities.

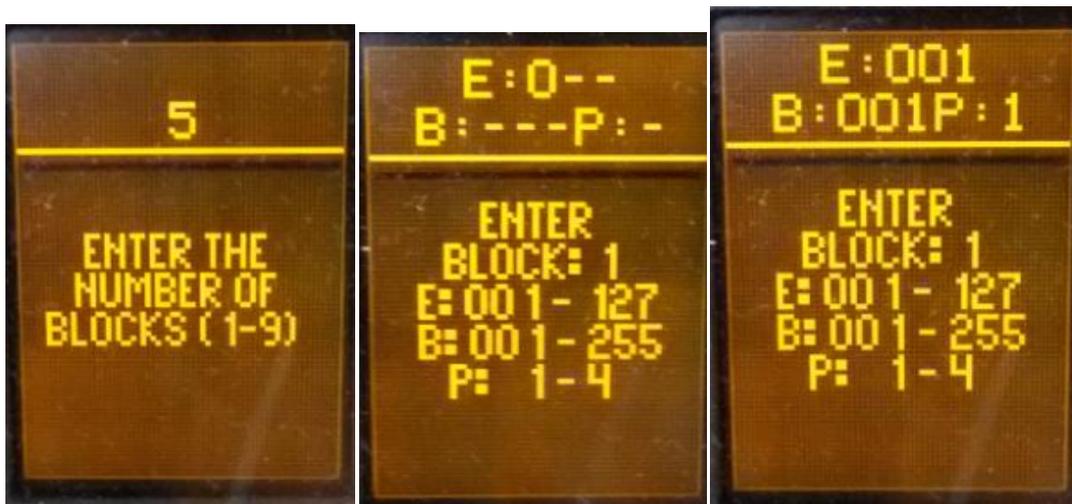
- 1) Function **Programming** is for program interesting values, which will be displayed in boardcomputer mode (Only upper two lines).  
Function has next four possibilities:
  - a) New programming - complete programming of all values, which will be displayed in boardcomputer mode.
  - b) Edit block - programming of one selected value
  - c) Add block - add one value to the end of memory
  - d) Delete block - delete one selected value.
- 2) Function **Diagnostics**:
  - a) Boardcomputer – switching to boardcomputer mode
  - b) Group read – reading of 4 values in vag-com "measurement values" from ECU.
  - c) Errors read – reading of trouble codes from ECUs.
  - d) VAG-COM – this is for connecting the external diagnostic tool.
- 3) Function **Adaptation** is for modify timing if Maxi-K unit has problems with communication.
  - a) Init delay – timing of init baudrate
  - b) Byte delay – timing of waiting between bytes.
  - c) Mess. delay - timing of waiting between each messages.
  - d) Calibrate – Automatic calibration of oscilator. It is only for units, which was sold before 15.12.2014.
- 4) Function **Update** is for update firmware in Maxi-K unit. New firmware can be installed only by KKL diagnostic cable.
- 5) Function **Other** shows other possibilities, for example activation of parking assistant, software and hardware version, activation/deactivation of eblem, selecting language and switching to radio mode (only for Maxi-K with hardware 3.0R).

## 4.2 Menu programming:



### 4.2.1 Function New Programming:

In main menu, select "Programming" by DOWN button, to confirm function, press RES button (UP button on Audi). In menu programming, select "New Programming". Follow the instructions on the screen.



By DOWN button, select the number of values, which you want to program. To confirm, press RES button (UP button on Audi).

Next step is programming of the ECU address, first you must select hundreds by DOWN button, confirm by RES (UP button on Audi), next the tens, confirm RES (UP button on Audi) and then units and also confirm by RES (UP button on Audi).

Next you must program the number of group of measurement values (block). It is the same as in programming of ECU adress. Last is the position of selected value in the group.

On the picture, I select the ECU 001 (engine), group 001 - first group, and position 1 in group 001 - there is the value of engine RPM. So, before programming, it is necessary to find out all values, which are interesting for you. You can make it by VAG-COM, or in service manual.

**Warning!! We must entering the ECU adress in decimal system. For example, instrument cluster has adress 17 - this is adress in hexadecimal system, in decimal system, it is 23. To conversion, you can use for example windows calculator.**

After entering the ECU adress, group number and position of selected value, you must program the caption of this value. By DOWN button, you can select the letter, to confirm letter, use RES button (UP button on Audi). You can set max. 8 letters. If you want shorter caption, confirm next letters as space.



When confirmation of all 8 letters is complete, Maxi-K save this value and then you can program next value.

After programming all values, Maxi-K will go back to the menu. Now you can go to boardcomputer mode. Select "Back" in Programming menu, then select "Diagnostic" in main menu and then select "Boardcomputer".

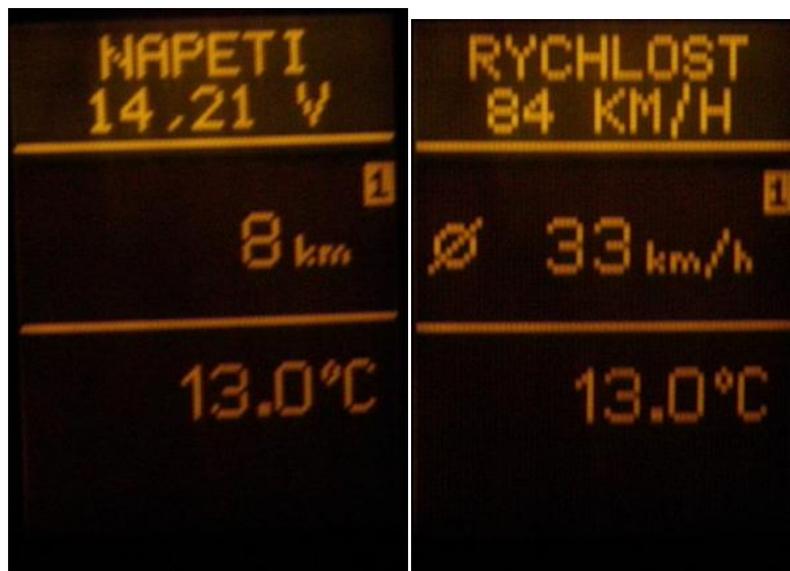
Now you will see the starting of communication sequence.



TIP: I strictly recommended to program values from one ECU consecutively. For example values 1,2,3,4,5 from engine ECU and 6,7,8 from Instrument cluster. Not at random, because Maxi-K must always start new communication sequence when the value is from other ECU and it may take several seconds.

On the picture, the variable (RPM) is automatically selected by code from ECU and it can not be changed.

Next pictures showing some possibilities of values, which you can select. Of course, it always depend on ECUs, which values they support.



Warning!! On engines 1.9 TDI and TDI PD is not possible to start new communication sequence, if the RPM is higher then 2000. It is not fault, but property of this engine ecu. The ongoing connection will not be stopped and Maxi-K will show selected value on any RPM. If you have all preprogrammed values from only one ECU, you will not have problems with this.

#### 4.2.2 Function Edit block:

This function is for changing one selected value. After select this function, you must enter the number of selected value. Then you can completely program this value again. You can not select this function, if you don't have preprogrammed any value.

#### 4.2.3 Function Add block:

This function is for add new preprogrammed value to the end of memory. It can not be selected, if you have preprogrammed all 9 values.

#### 4.2.4 Function Delete block:

This function will delete one selected preprogrammed value. You can enter the number of value and confirm RES (UP on Audi). This value will be deleted. Function can not be selected, if you don't have any preprogrammed value.

### 4.3 Menu Diagnostic:



#### 4.3.1 Function Boardcomputer

This function will switch Maxi-K to boardcomputer mode.

#### 4.3.2 Function Group Read

This function is for reading group of measurement values from the ECU. After select this function, you must enter the adress of selected ECU and number of selected group. It is the same principle, as in programming of values.



It can help you for example to diagnose turbo, MAF, etc.

Between groups, you can listing by selecting "NEXT" or "PREVIOUS". To go back to the menu, select "BACK". Reaction on pressing the button can be executed with little delay, but no more then 0,25 seconds.

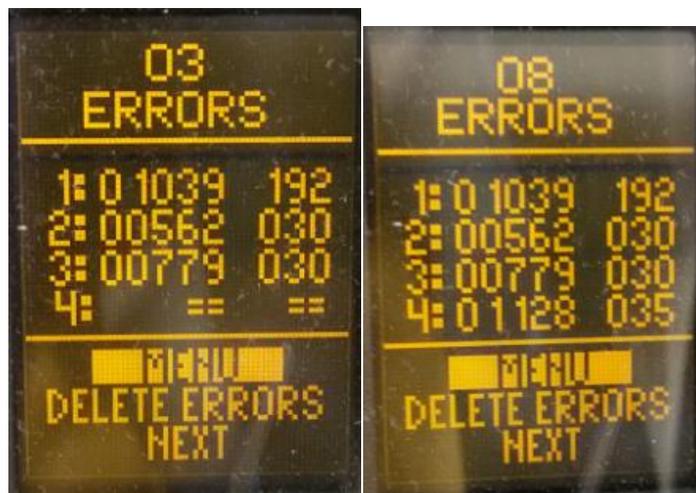
#### 4.3.3 Function Errors read:

This function can read diagnostic trouble codes (DTC) from selected ECU. Maxi-k can read at once max 16 codes. It is showing as numbers, so to decode, it is necessary to find code in service manual, or on the internet. For example, if you have an error:

**17965- boost pressure regulation, regulation limit exceeded, P1557-3500**

Maxi-K will show 17965 35.

After select this function, you must enter the adress of ECU. Same principle, as in programming of values.



You can also delete errors by select "DELETE ERRORS".

If you have more than 4 errors, select "NEXT". Maxi-K will show you next 4 trouble codes. If you are on the end (see the picture), and if you select "NEXT", you will see the first 4 errors again.

#### 4.3.4 Function VAG-COM (PC Diagnostics):

It is necessary to select this function, if you want to make diagnostic by external vag-com diagnostic tool. First select this function, and after connect tool to the car. NOT SOON!! Diagnostics tool may not be able to work. To turning the Maxi-K on, you must turn the ignition off and on again.

#### 4.4 Menu Adaptation:

Those functions are for modify timing. If Maxi-K has problems with starting communication sequence or communication will failure, maybe you can modify the timing.

"INIT DELAY" you can set, if Maxi-K has problems with starting communication. Try to find limit values, when the Maxi-K works and set the middle. For example, if Maxi-K works between 198mS - 204mS, then set 201mS.

"BYTE DELAY" and "MESS. DELAY" are no need to change.



Function "CALIBRATE" will make automatic calibration. It works only on first batch of units (sold before 15.12.2014)

**Warning!! On engines 1.9 TDI and TDI PD is not possible to start new communication sequence, if the RPM is higher than 2000. It is not fault, but property of this engine ecu. The ongoing connection will not be stopped and Maxi-K will show selected value on any RPM. If you have all**

preprogrammed values from only one ECU, you will not have problems with this.

#### 4.5 Function Update

This function is for update firmware by diagnostic KKL cable. All preprogrammed values will be retained. You can use only KKL cable, not HEX-COM, HEX-CAN, K+CAN, etc...

#### 4.6 Menu Other

Here you can activate other functions.



##### 4.6.1 Parking assistant:

Maxi-k supports displaying of distances in centimeters from all 4 sensors. This is only for original parking assistants, which must be connected to k-line. You can also select version BACK+FRONT - it works for example on VW Sharan. If you have also front sensors, I recommend to install special switch to activate this function, otherwise assistant will be active only, when you select reverse gear.



Function will automatically start on reverse gear, if it was activated in the menu and cables is connected. **Function is active only in boardcomputer mode with minimaly one preprogrammed value.**

To using this function, is necessary to connect brown cable to reverse gear light. It can be found for exapmple in A - column under dashboard next to pedals. After connecting, try to measure voltage on cables. With ignition on, on brown cable must be +12V on reverse gear and 0V otherwise.

#### **4.6.2 Version**

This will show you the current version of hardware and software

#### **4.6.3 Language**

Here you can select the language. Also there you can set the special mode for Audi vehicles.

#### **4.6.4 Logo**

This function allows you to deactivate eblem.

#### **4.6.5 Radio / Navi**

This function is able only on Maxi-K software 1.15+ and hardware 3.0R. When you select this function, Maxi-K will switch ENA IN, DATA IN and CLOCK IN to ENA OUT, DATA OUT and CLOCK OUT. So the navi or radio will show information on MaxiDot. To go back to Maxi-K menu, press and hold RES button and click DOWN button. After lets both button, Maxi-K will be turned on again. Also if you turn the ingniton off and on again, Maxi-K will automatically start.



#### 4.6.6 Function IMMO-SAFE

Feature allows secure access to the main menu with 4-digit PIN. In the Board-computer mode, while reading values from the ECU, the diagnostic bus is always blocked during an ongoing connection Maxi-k <-> ECU. IMMO-SAFE function blocks the entrance to the main menu, unless you enter a user-defined PIN and Maxi-K continues to block diagnostic bus to protect it against unauthorised use, e.g In an attempt to disable the immobilizer when theft of the vehicle.

The function is activated automatically when entered code in "Other" -> "Immo-Safe" is between "0001-9999". When you enter the code "0000", function will be disabled.

Entering numbers is done in the same way as when programming blocks.



## 4.7 Special functions

### 4.7.1 Eblem as one of preprogrammed value

To display the eblem as one of preprogrammed value, program the ECU 086, Block 001 and Position 1. Entered label will no effect. If the eblem will not show correctly, you can press RES button to draw it again.

### 4.7.2 Displaying the full screen speed

To program full screen speed as one of preprogrammed value, enter ECU 023, B 254, P1. Programmed caption will be displayed. If you will open door and maxidot will show opened doors. The Maxi-K unit is not able to detect this fact, so after closing door, speed will be displayed only then you will accelerate. Also you can press RES button (UP on Audi) to display speed sooner, when you are stopping.



### 4.7.3 Displaying the graphic turbo

To program this block, set the ECU: 001, B: 250, P: 1 (for 1.9 TDI), P: 2 (for TDI PD), P: 3 (for 1.8T)



#### **4.8 Drawing own eblem:**

To draw your own eblem, you can use simple tool in windows. It is necessary to comply these conditions:

- picture resolution 64x88 pixels
- Only black and white colors. Not shades of gray!!!
- black pixel = lighting pixel on screen
- only PNG format

#### **4.9 Update procedure**

1. Connect the diagnostic KKL cable to socket and turn the ignition on.
2. Turn the Maxi-K to the menu and select "Update" (to confirm, press RES button (Up for Audi) for 2 seconds).
3. Run the Maxi-k firmware updater on PC, select COM port with KKL cable. If Application can not be run, try to turn off your antivirus software. Always use only Windows Vista or newer. (7,8,8.1 and 10 are supported).
4. Click on "Test COM"
5. If application find unit, you will see "Found Maxi-K on COMx"
6. Click on "Program!". Waiting for instalation. If windows will write message "Program not responding", never close the aplication!! Maxi-k may stop working!! Update is still in progress.
7. After successfully instalation, you will se "Maxi-K successfully programed".
8. Turn the ignition off and wait 10 seconds.
9. Turn the ignition on, update is complete.