TK-Prog V 1.7

Smart-key registration equipment for

Lexus, Toyota and Subaru passenger cars

Operation Manual

Content table

1. Equipment purpose

TK-Prog is advanced equipment set for electronic smart-key registration within Lexus and Toyota passenger cars:

- **Lexus:** LX 570, GX 460, RX, LS 460, GS, IS;

- **Toyota:** Land Cruiser 200, Land Cruiser Prado, RAV4, Venza, Corolla;

- **Subaru:** Impreza, Forester, Legacy, Outback.

2. System composition

The set includes 2 devices:

- **Basic programming tool** for *primary** smart-key registration;

- **OBD programming tool** for *permanent* smart-key registration.

   * *primary* smart-key allows to launch the engine, but remote door blocking function does not work. Car start is possible only if the smart-key is no farther than one centimeter from the start button. Remote doors blocking can be activated by OBD programming tool as well as *permanent* smart-key registration**.**

OBD programming tool (fig. 1) is a stand-alone unit built in OBD-II connector with single button.

Basic programming tool (fig. 2) is a stand-alone unit with LCD and keypad. It has a clip-connector for Certification unit and USB-socket for connection with PC and charging.

3. System main functions

- Primary smart-key registration in Certification unit (it allows to start the car without original key).

- Permanent smart-key registration (including keyless start and remote door lock operation).

- Smart-key testing for compatibility with the Certification unit (smart-key type detection).

- Certification unit memory backup and restore, reset into initial state (if an unexpected situation occurs during programming).

- Erasing all registered keys in Certification unit except one.

- Used keys registration (that has been already registered on another car).

- Odometer correction by dashboard EEPROM in-circuit programming.

As additional function TK-Prog could be used as EEPROM programming tool (supported chips: 93C46, 93C56, 93C66, 93C76, 93C86). It can read the Certification unit memory and save within basic programming tool in binary-format files. You can fetch bin-files via USB interface (computer recognizes the programming tool as a Mass storage device). Also basic programming tool can record selected bin-file into the Certification unit memory.

System advantages

- TK-Prog allows to start the car without any original key.

- Smart-keys registration procedure is performed only in the Certification unit. No need to program immobilizer unit, steering wheel latch unit. This considerably simplifies and accelerates registration of smart-keys.

- Automatic smart-key type detection (for each particular car) by reading the Certification unit memory.

- Used smart-keys registration possibility (not only brand new keys).

- Simple user interface and operation sequence, built-in flashlight.

4. Basic programming tool operation instruction

Turn on the programming tool by pressing 'Return (Power)' button for about 5 seconds. You can navigate on-screen menu by mini-joystick, 'Enter' and 'Return' buttons. Pressing on the centre of joystick works as 'Enter' button. You can turn on built-in flashlight by holding mini-joystick in 'left' position for about 2-3 seconds. Internal battery charge is indicated on a top right corner of the LCD-screen. If battery charge is low simply connect the programming tool into PC USB port.

Fig. 3 Basic programming tool on-screen menu and navigation buttons

On-screen menu structure table

Menu level	1	2	3
Menu entry	Normal	Program KEY	
		Test KEY	
		Return KEY	
		Reset EEP	
		EEtype	93C86
			93C66
	Professional	Read EEP	
		Write EEP	
		Reset EEP	
		Folder	
		Test KEY	
		EEtype	93C86
			93C66
	EEPROM tool	93C46	Read
			Write
		93C56	Read
			Write
		93C66	Read
			Write
		93C76	Read
			Write
		93C86	Read
			Write
	Odometer tool	GX 460 (93c86)	
		GX 470 (93c66)	
		LC 100 (93c66)	
		LC 200 (93c86)	
		LX 470 (93c66)	
		LX 570 (93c86)	
		Prado 120 (93c66)	
		Prado 150 (93c86)	
		RX (93c46)	
		RX 350 (93c66)	
		RX 400H (93c66)	
		Venza (93c66)	
	Setting	Info	ver. FF.FF.FF
			S/N FFFFFFFF
		Contrast	
		Brightness	
		Flashlight	
		Backlight time	
		KBD vol	
		Reset counter	
		Reset config	
		License	
		Password ODO	

5. Equipment functions description

<u>**Attention!**</u> There are few different types of Certification units on Lexus and Toyota vehicles, and two different types of EEPROM chip are used: 93C66, 93C86. You have to select appropriate type before operating basic programming tool. Go to 'Normal' or 'Professional' submenu, point 'EEtype' entry and choose required type using 'left' / 'right' joystick position.

5.1   Primary smart-key registration in Certification unit ('Program KEY')

This function is used when you need to start a car without original smart-key. To perform *primary* key registration you need basic programming tool and <u>smart-key of appropriate type</u>. Known smart-key types for Lexus and Toyota: **94, D4, 98**. Pay special attention for 98-type: it could be 1-chip or 2-chip that are <u>not equivalent</u>. Refer to section 5.7 for smart-key type detection.

Registration procedure involves following steps:

1. Remove the Certification unit (fig. 4), disconnect connectors and take out internal board from its casing (fig. 5).

2. Plug clip-connector cable in basic programming tool.

3. Clean IC003 chip pins on the Certification unit board.

4. Attach clip-connector to the Certification unit board (fig. 6). **Attention!** Red wire on clip-connector must be linked up with first pin on IC003 chip. Serious damage to Certification unit may occur if connection is wrong.
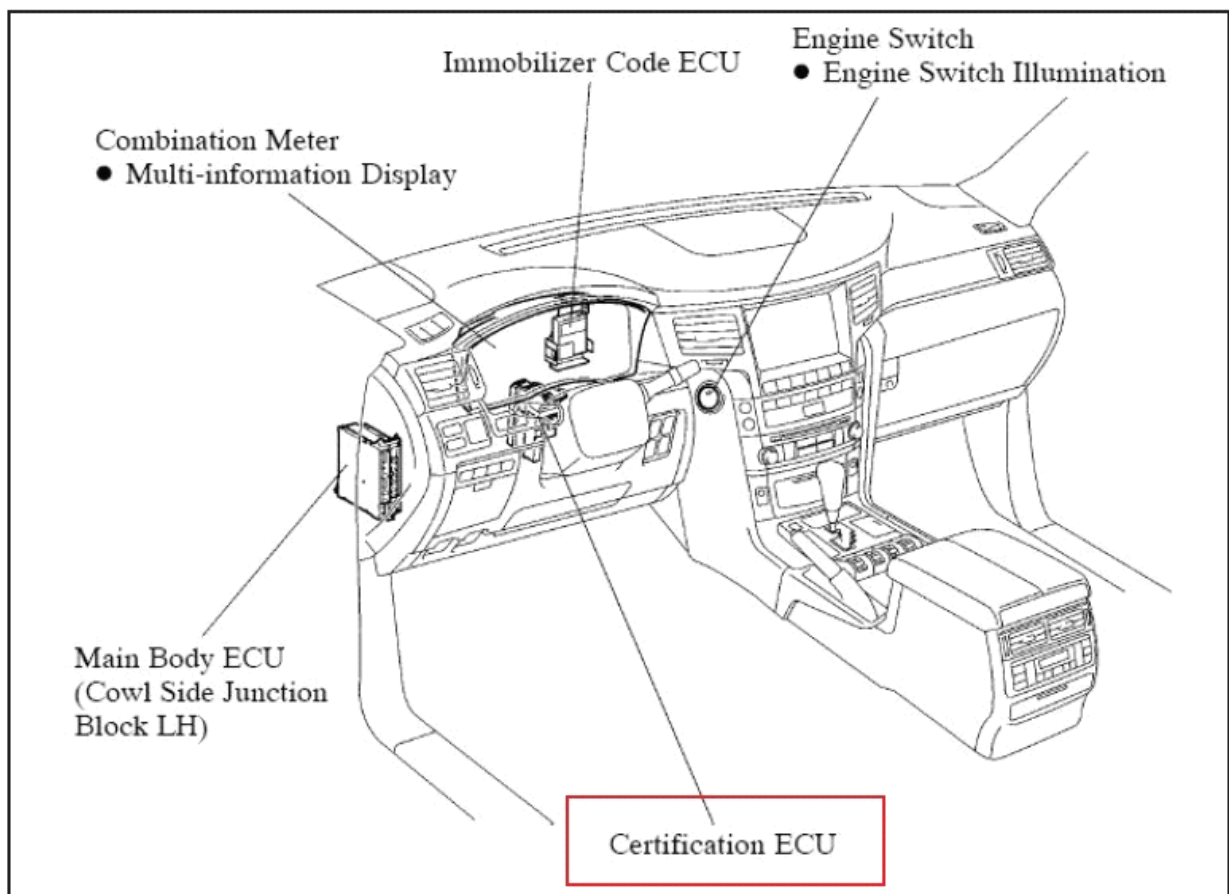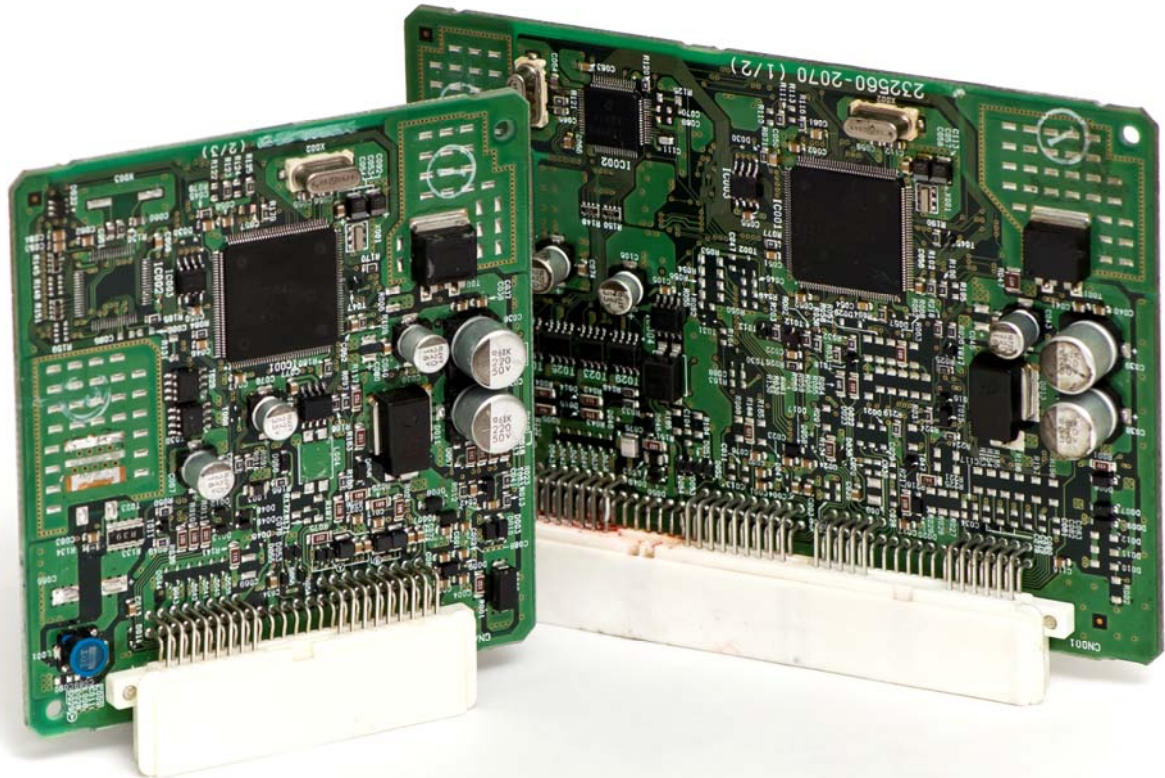

Fig. 4 Certification unit location

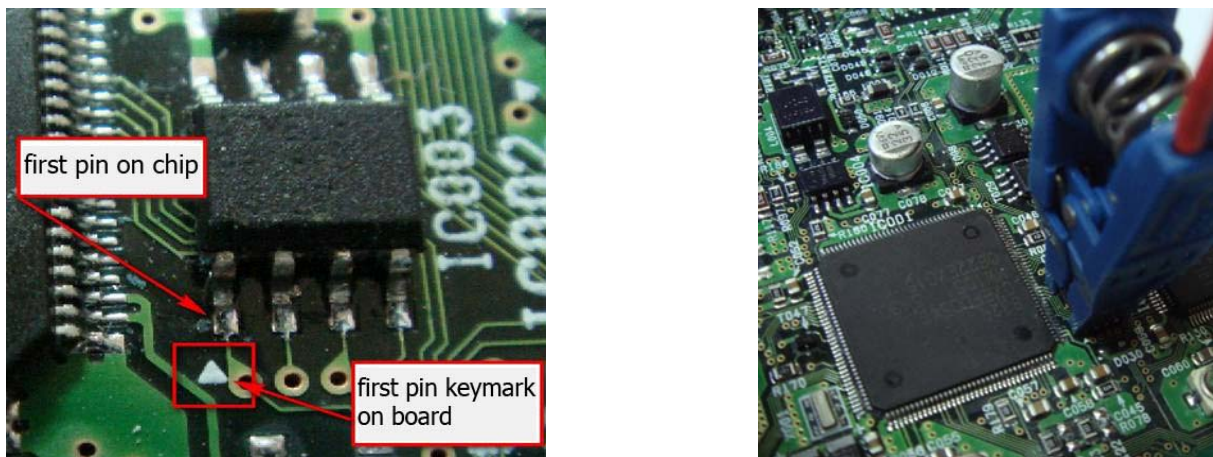Fig. 5 Certification unit board typical view

Fig. 6 Connection example with Certification unit board

5. Select 'Normal' mode in main menu and then – 'Program KEY' entry.

If Certification unit memory reading performed successfully you will see such message on LCD: "Reading… OK 98". Figure 98 mean smart-key type that you can use for current Certification unit (smart-key type detection described in section 5.7).

If electrical contact between clip-connector and IC003 chip is bad you will see message "Waiting EEP Press 'Enter' to cancel" on LCD. When normal contact will be restored another message appears: "Reading… OK 98". Also you can cancel the operation by pressing 'Enter' button. In this case you have to select 'Normal' mode → 'Program KEY' in main menu to retry the operation.

If Certification unit memory reading was unsuccessful message "Reading… ERROR" occurs on LCD. In this case press 'Enter' button to return to 'Normal' submenu.

6. After successful reading press 'Enter' button. Message "Saved file EEP34.BIN" will appear. It means that Certification unit memory content was saved in basic programming tool internal storage as EEP34.BIN file.

7. Press 'Enter' button once again and you will see message: "Put on a key or press 'Enter' to cancel".

   If information in Certification unit memory is incorrect and smart-key registration is impossible you will see message: "data1: 98, 00 EEP ERROR". In this case you may require software restore in Certification, Immobilizer units and steering wheel latch unit.

8. Put a smart-key of appropriate type on basic programming tool as shown on fig. 7.

   On successful smart-key reading message "data1:98,02 Page1:98 KEY ok" will appear, and later "Modification is done". It designates that the smart-key is registered in current Certification unit.

   If the smart-key have improper type message "data1:98,03 Page1:94 Page1 Error" will appear. You have to bring up correct smart-key (as detected on step 5) to complete registration procedure.

9. Press 'enter' button to return to 'Normal' submenu.

Fig. 7 Basic programming tool with smart-key on it

5.2 Certification unit memory backup and restore ('Return KEY')

This function is used when you need to restore initial state of Certification unit (as before *primary* key registration). To perform restoration you need basic programming tool and binary file with backup data. The file was made automatically during primary key registration (refer to section 5.1).

Restoration procedure involves following steps:

1. Remove the Certification unit (fig. 4), disconnect connectors and take out internal board from its casing (fig. 5).

2. Plug clip-connector cable in basic programming tool.

3. Attach clip-connector to the Certification unit board (fig. 6).

4. Select 'Normal' mode in main menu and then – 'Return KEY' entry.

    As you start return procedure, message "Writing…" will appear on LCD. If programming process completes successfully you will see next message several second later: "Writing… OK EEP34.BIN Returned". It means the Certification unit is in initial state.

    If any error occurs during programming the message will be as follows: "Writing… ERROR".

    Press 'Enter' to exit restore mode.

5.3 Permanent smart-key registration (brand new keys)

To perform *permanent* key registration you need OBD programming tool, registered primary key or working original smart-key and brand new smart-keys of appropriate type.

For permanent smart-keys registration follow next step-by-step instruction.

1. Plug OBD programming tool into car OBD-connector.

2. Push button on OBD tool once. You will hear short beep and immobilizer indicator on dashboard will stop blinking. This indicates smart-key registration procedure have begun.

3. Bring primary (or original) smart-key to the start button within 30 seconds after sound signal.

4. You will hear short beep once again. Bring the primary (or original) key out of the car.

5. Bring new smart-key to the start button within 30 seconds after sound signal.

6. Put new smart-key on front passenger seat after a short sound signal.

7. Second sound signal will inform you about successful key registration. Bring the key out of car.

    No sound signal means the key was not registered. There are two most common reason for this issue: (a) smart-key, that you have tried to register, has improper type; (b) smart-key, that you have tried to register, is locked – already registered on another car. See chapter 5.6 for locked smart-keys issue.

8. To register more smart-keys repeat steps 5 to 7.

9. After last smart-key registration you should wait until the OBD programming tool beeps long and immobilizer indicator on dashboard starts to blink. After that you may unplug OBD tool – registration procedure is completed now.

After this procedure primary key can be only used for engine start. To enable remote door lock operation repeat whole procedure, but use registered permanent smart-key as first (primary).

5.4 Erasing all registered smart-keys except one

You should use this function when you want to register smart-keys that have been already registered on other cars, or in case of lost keys. For this function you need OBD programming tool and one of smart-keys that you want leave as registered.

Follow next step-by-step instruction to erase all registered smart-keys except one.

1. Plug OBD programming tool into car OBD-connector.

2. Push button on OBD tool for 3-4 seconds. You will hear two short beeps and immobilizer indicator on dashboard will stop blinking. This indicates erasing procedure have begun.

3. Bring the smart-key to the start button within 30 seconds after sound signal.

4. You will hear short beep and immobilizer indicator on dashboard starts to blink. Procedure completed successfully.

5. Now you should wait until the OBD programming tool beeps long. After that you may unplug OBD tool.

5.5   Certification unit reset ('Reset EEP')

You should use Reset function when you need to register used smart-keys (that have been already registered on other cars). To perform reset you need basic programming tool.

Attention! You will non be able to start the car after Certification unit reset. To start the car you have to register at least one key or restore Certification unit memory as described in section 5.2.

Reset procedure involves following steps:

1. Remove the Certification unit (fig. 4), disconnect connectors and take out internal board from its casing (fig. 5).

2. Plug clip-connector cable in basic programming tool.

3. Attach clip-connector to the Certification unit board (fig. 6).

4. Select 'Normal' or 'Professional' mode in main menu and then – 'Reset EEP' entry.

   If electrical contact between clip-connector and IC003 chip is bad you will see message "Waiting EEP Press 'Enter' to cancel" on LCD. When normal contact will be restored another message appears: "Reading… " and then "Saved EEP34.BIN". It means Certification unit memory content is saved in binary file so you can restore it if you need. Press 'Enter' to continue.

   If resetting process completes successfully you will see "Writing… OK" message after several seconds. If any error occurs during resetting the message will be as follows: "Writing… ERROR".

   Press 'enter' to exit reset mode.

5.6   Used (not brand new) smart-key registration

To perform used smart-keys (that have been already registered on another car) registration follow next step-by-step instruction.

1. If there is no registered key on the car perform *primary* key registration procedure (refer to section 5.1).

2. Perform erasing procedure (refer to section 5.4). Use *primary* or original key for this.

3. Perform reset procedure (refer to section 5.5).

4. Perform permanent smart-key registration procedure (refer to section 5.3) with used (not brand new) smart-keys of appropriate type.

5.7   Smart-key type detection ('Test KEY')

This function is used to detect smart-key type and to check compatibility with particular Certification unit. You need basic programming tool to perform detection.

You can start testing by selecting 'Test KEY' in 'Normal' or 'Professional' submenu. Message "Put on a key or press 'Enter' to cancel" will be displayed until you put a smart-key on basic programming tool. If the key is recognized you will see message like this: "Data1: 94".It means you can use this smart-key with corresponding Certification unit (as described in section 5.1).

Press 'Enter' to exit testing mode.

5.8   Door unlock function

All doors will unlock automatically when you plug the OBD tool into OBD-connector. This function is available only for 2010-2012 model year cars.

6. Additional functions description

6.1   Reading and saving certification unit memory ('Read EEP')

This function allows to read Certification unit memory and save it as binary file, and also to register *primary* key. You need basic programming tool to use this function.

Reading procedure execution order:

1. Remove the Certification unit (fig. 4), disconnect connectors and take out internal board from its casing (fig. 5).

2. Plug clip-connector cable in basic programming tool.

3. Clean IC003 chip pins on the Certification unit board.

4. Attach clip-connector to the Certification unit board (fig. 6).

5. Select 'Read EEP' entry in 'Professional' submenu and press 'Enter' button.

    If Certification unit memory reading performed successfully you will see message: "Reading… OK data1: 98 Save?" Figure 98 mean smart-key type that you can use for current Certification unit (smart-key type detection described in section 5.7).

    If electrical contact between clip-connector and IC003 chip is bad you will see message "Waiting EEP Press 'Enter' to cancel" on LCD until normal contact will be restored.

    If reading procedure was interrupted or completed incorrectly message "Reading… ERROR" appears on LCD. Press 'Enter' to exit reading function.

6. Press 'Enter' button to complete reading and save a file. You will see message: "Saved EEP34.BIN". It means Certification unit memory content is saved in binary file so you can restore it if you need.

7. Press 'Enter' to continue and modification request will appear: "Modify?" Press 'Enter' to confirm *primary* key registration or 'Return' to dismiss.

8. As you have confirmed modification you will see message: "Put on a key or press 'Enter' to cancel". At this time you have to put a smart-key of appropriate type on basic programming tool as shown on fig. 7.

    If information in Certification unit memory is incorrect and smart-key registration is impossible you will see message: "data1: 98, 00 EEP ERROR". In this case you may require software restore in

Certification, Immobilizer units and steering wheel latch unit.

9. On successful smart-key reading message "data1: 98,02 Page1: 98 KEY OK" will appear, and later "Modification is done". It designates that the smart-key is registered in current Certification unit.

    If message "Write ERROR" appears, it means the smart-key is not registered and you have to repeat procedure.

10. Press 'Enter' button to return to 'Professional' submenu.

6.2   Binary file recording into Certification unit memory ('Write EEP')

This function allows you to write any binary file stored in basic programming tool into Certification unit memory.

Writing procedure execution order:

1. Remove the Certification unit (fig. 4), disconnect connectors and take out internal board from its casing (fig. 5).

2. Plug clip-connector cable in basic programming tool.

3. Attach clip-connector to the Certification unit board (fig. 6).

4. Select 'Write EEP' entry in 'Professional' submenu and press 'Enter' button.

    If IC003 chip test completes correctly you will see internal storage directory overview on LCD. Use 'Up' and 'Down' mini-joystick position to select file and then press 'Enter'.

5. As you have confirmed writing you will see message: "Writing... OK".

    If Certification unit memory writing was unsuccessful message "Writing... ERROR" appears on LCD. Press 'Enter' button to return to 'Professional' submenu.

6.3   Internal storage directory review ('Folder')

This function allows you to view internal storage content of basic programming tool. Select 'Folder' entry in 'Professional' submenu and press 'Enter' button to call the function. Use 'up' and 'down' mini-joystick position for navigation over directory, 'Return' for exit.

7. EEPROM programming mode ('EEPROM tool')

You can use basic programming tool as EEPROM programming tool. Supported chips: 93C46, 93C56, 93C66, 93C76, 93C86. Programming could be performed on-board without unsolder.

7.1   EEPROM read function

Reading procedure execution order:

1. Plug clip-connector cable in basic programming tool.

2. Clean EEPROM chip pins.

3. Attach clip-connector to the EEPROM chip.

4. Select chip type (93C46, 93C66 or 93C86) in 'EEPROM tool' submenu then 'Read' entry and press 'Enter' button.

    If electrical contact between clip-connector and chip is bad you will see message "Waiting EEP

Press 'Enter' to cancel" on LCD until normal contact will be restored.

If reading procedure was interrupted or completed incorrectly message "Reading… ERROR" appears on LCD. Press 'Enter' to exit reading function.

5. If contact is normal another message appears: "Reading… " and then "Saved EEP34.BIN". It means EEPROM content is saved in binary file. Press 'Enter' button to complete the operation.

6. Press 'Enter' button to return to main menu.

7.2 EEPROM write function

Writing procedure execution order:

1. Plug clip-connector cable in basic programming tool.

2. Clean EEPROM chip pins.

3. Attach clip-connector to the EEPROM chip.

4. Select chip type (93C46, 93C66 or 93C86) in 'EEPROM tool' submenu then 'Write' entry and press 'Enter' button.

If electrical contact between clip-connector and chip is bad you will see message "Waiting EEP Press 'Enter' to cancel" on LCD until normal contact will be restored.

5. If EEPROM chip test completes correctly you will see internal storage directory overview on LCD. Use 'Up' and 'Down' mini-joystick position to select file and then press 'Enter' to confirm writing or 'Return' to dismiss.

6. As you have confirmed writing you will see message: "Writing… OK".

If EEPROM writing was unsuccessful message "Writing… ERROR" appears on LCD.

7. Press 'Enter' button to return to main menu.

8. Odometer tool mode

This function allows you to correct odometer indication on dashboard by EEPROM in-circuit programming. Correction procedure involves following steps:

1. Check and note current odometer indication.

2. Dismount dashboard from car and remove back cover.

3. Clean EEPROM chip pins and attach programming tool using clip-connector.

4. Select car model and corresponding EEPROM type in 'Odometer tool' submenu and press 'Enter' button.

If electrical contact between clip-connector and chip is bad you will see message "Waiting EEP Press 'Enter' to cancel" on LCD until normal contact will be restored.

5. On successful EEPROM reading message "Saved in EEP34.BIN" will appear. It means dashboard EEPROM content is saved in binary file so you can restore it if you need.

6. Press 'Enter' button. Next dialog "OLD ODO: xxx. OLD ODO OK?", where xxx – calculated current mileage, asks you to confirm correctness of mileage.

7. If so press 'Enter' button and you will see message: "[NEW ODO]" and numeric field. Enter new desired odometer indication and use ⌐ for confirmation. On successful writing message "ODO

successfully corrected" will appear.

If calculated mileage <u>is not equal</u> to real odometer indication, correction is not possible. You should press 'Return' button to abort procedure.

8. Remount back cover on dashboard and install it on the car. Turn on ignition and check correctness of new odometer indication. If mileage is wrong you should restore saved file using "EEPROM tool" function (as described in section 7.2).

It is possible to lock Odometer correction function by password. You may choose 'Locked' or 'Unlocked' state in 'Password ODO' entry in 'Settings' submenu. This locking possibility is very useful in case of limited permissions sale or rent.

9. Settings mode description

In 'Settings' mode you have access to following adjustments:

- LCD contrast – 'Contrast';

- LCD backlight brightness – 'Brightness';

- LCD backlight timeout – 'Backlight time';

- key press sound volume – 'KBD vol';

- built-in flashlight brightness – 'Flashlight';

- return setting to default – 'Reset config'.

Use 'left' and 'right' mini-joystick position to adjust parameters, 'Return' button for exit.

DC-charger connection and USB connection are indicated on LCD in upper right and upper left corners respectively.
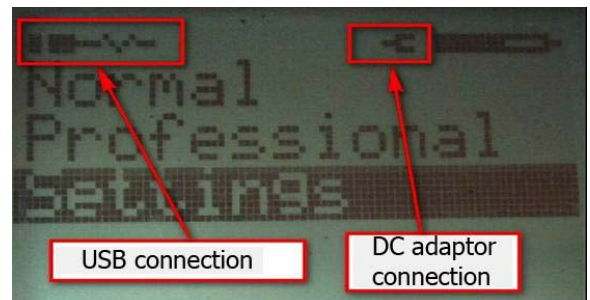
9.1 Counter reset for saved binary filenames ('Reset counter')

This function is used to reset filename counter in internal storage of basic programming tool. Select 'Reset counter' entry in 'Professional' submenu and press 'Enter' button to call the function. Please note: filename reset will NOT cause file removal. To delete files from the storage use USB connection to PC (computer recognizes the programming tool as a Mass storage device).

9.2 Limitation for registered keys number (License function)

You may limit number of keys that could be registered with TK-Prog. Choose 'License' entry in 'Settings' submenu, then set 'Lic' parameter. On every successful key registration 'Lic' number will decrease by 1. You may lock 'Lic' parameter editing by password (use 'Set Password' entry).

10. Key registering specificity for Subaru cars

TK-Prog allows to register only *primary* keys on Subaru vehicles. You should use dealer equipment to register *permanent* keys. Workflow sequence is the same as on Toyota and Lexus cars (as described in section 5). It is necessarily to use smart-key blank of appropriate type (as detected by basic programming tool) – usually **9F** type.