

# Tango+ for Toyota/Lexus OBD Framework

## I. Getting Started

### Introduction

This Help relates to Tango+ for Toyota software of version V6.0 up.

The Toyota module of Tango+ is the OBDII solution for Toyota's vehicles.

The software has various options and scenarios depending on a car's year and configuration.

The software supports CAN and KWP2000 communications with a vehicle.

To use this software you need to have:

- Tango programmer
- J2534 PassThru Adapter

To run the software in the restricted mode it is possible not to have the Tango programmer. The restricted mode allows connecting with a vehicle, read the PartNo. of the detected immobilization system, quantity and types of used keys etc. The listing of available actions depends on the scenario and vehicle's security system features and the year of issue.

### Updates

Download of Tango+ Toyota is done through Tango main software (Tango.exe):

Help->Updates->Check Updates.

### J2534 PassThru Adapter

The software uses the Pass Thru adapter to communicate with the car's network.

Our company neither manufactures nor sells the Pass Thru adapters.

Pass Thru adapters are quite common and there are many different manufacturers worldwide.

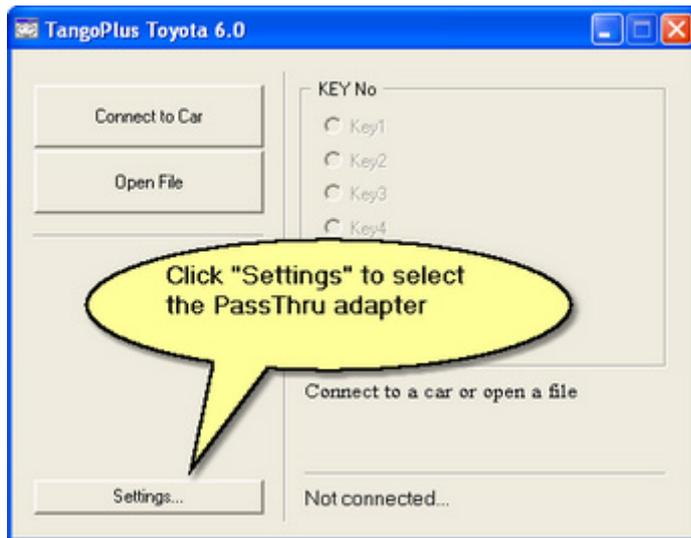
Usually there are no special differences between all these adapters.

Each manufacturer supplies a driver for its adapter. The driver is suitable for adapters of this manufacturer.

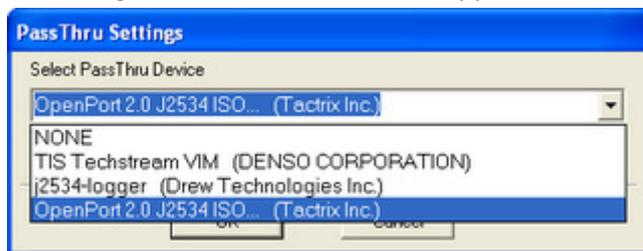
The drivers and adapters are not interchangeable along all manufacturers. You should avoid assigning a driver of one manufacturer to an adapter of another manufacturer.

The Toyota software allows user to assign any of installed drivers to his adapter, but this does not mean that the wrong assign will operate correctly.

Install the driver as required by the adapter manufacturer. Launch Tango+ Toyota.exe (physically adapter is not needed) and click the **SETTINGS** button:



The dialog with available drivers will appear:



From the drop down menu select driver appropriate for your adapter and click OK. The program asks for a confirmation and retains the selected driver choice. Further work will not require driver selection. If program can't communicate with the adapter it will substitute your choice in an attempt to establish communication. If an adapter of another manufacturer is connected it is necessary to assign the right driver.

**If there are no drivers in the drop list (only the NONE string), it means that this computer does not have installed drivers at all**

## FAQ

**Q:** I already have the Pass Thru adapter of Techstream. Is it compatible to the Toyota+ software?

**A:** Yes, it is fully compatible.

**Q:** Which adapters have been tested?

**A:** We have written the Toyota+ software using the Tactrix' adapter <https://goo.gl/QB9A2x> , also we have tested the Toyota MVCI.

The list of compatible adapters is posted on Tango Forum : <https://goo.gl/sbv00e>

**Q:** Is there known problems with adapters' drivers for Windows?

**A:** The only problem we have encountered is a weak support of 64-bit versions by most Chinese MVCI. Make sure when purchasing an adapter that it is compatible for your OS. Check adapter manufacturer details regarding drivers and OS support.

## SLK Transponders

The SLK transponders are battery powered. **Note that a battery is not included with an emulator and has to be obtained locally.** Three standard types of battery are compatible for our emulators: **CR1616, CR1620, CR1632.**

If battery is removed all key data from the emulator will be lost. When power is restored the default data will be loaded into the transponder memory.

**Thus the transponder can be cleaned to default state just taking off the battery.**

We did not test how long is the battery lifetime in this application, because of the main purpose of the SLK emulator is to get the authorization for learning of usual keys. However a CR1620 can supply about 9 months (depends on how often you start an engine) and therefore it is possible to use the emulator as an ordinary key for engine starting. The battery shouldn't much below 3V or emulator won't save data.

We are supplying five types of emulators. To distinguish each type we use the Color Code labels, see the picture:



*Color Codes from the left to the right: Yellow, Blue, Red, White, Pink.*

Page1	Logic	Orig. Chip	Emulator	Color Code
94	DST40	TMS37126	SLK-01	Yellow
D4	DST40	TMS37126	SLK-01	Yellow
98	DST80	TMS37126	SLK-02	Blue
88	DSTAES	TMS37200	SLK-03	Red
A8	DSTAES	TMS37200	SLK-03	Red
A9	DSTAES	RF430	SLK-04	White
39	DSTAES	RF430	SLK-05	Rose

The Tango software also can determine the type of a transponder:



The transponder is not programmed.  
Default state after the battery replacement.



The transponder is programmed.

## II. Models of Vehicles

### Overview

There are two common implementation conceptions of Toyota/Lexus security systems:

- Immobilizers
- Smart Key systems

### Immobilizer

The systems with blade keys are known as immobilizers. Existing types are the older **40bit** and newer **80bit** and **128bit**. Different types of immobilizers have particular features, thus for each Toyota+ software activates different scenarios and interfaces. Formally in "all keys lost" case at least one master key is required in order to program new keys. This situation requires a special procedure known as the "Immobilizer Reset". This procedure resets the immobilizer, making its memory clear of all keys and ready to learn a new key(s).

#### 40 bit Type

The only available scenario is **RESET**. Key types are ID67, ID68 etc.

#### 80- and 128 bit Type

For these Immobilizers Toyota+ software supports both **RESET** and **LEARN KEY** features. Key types are referred to as G- and H- type. Immobilizers of these types are differently configured depending on the market of use. We use arbitrary classification according to which these Immobilizers are divided in two market groups USA and European. Both groups can be encountered worldwide, but outside USA, European type is predominant. In general vehicles manufactured for the USA market are not problematic and Toyota+ software can be utilized fully by Tango users in order to reset them.

The vehicles manufactured for the European market are the most complex for reset. Generally they are of two sub-types:

- G-type (80bit encryption)
- H-type (128bit encryption)

Reset of G-type immobilizers of the European market is completely covered by Tango Toyota+. We haven't encountered models that cannot be reset by the software.

Reset of H-type immobilizers of the European market are partially available. Only some models may be reset. Generally they are encountered on the Chinese market.

## Smart Key Systems

The systems employing a key fob without a blade are known as the Smart Key Systems. Formally if a key is lost it is possible to learn an additional one, if a customer has at least one key. The situation "all keys lost" requires replacement of Certification ECU, Keycode ECU and Steering lock ECU. Our software allows to avoid wasting of money for the new ECUs. The underlying idea of our method is to use Emulator instead of the lost key and force the vehicle to learn a new key.

## Smart Key Systems

### How To make a Smart Key

#### Preface

Briefly explained the goal of this software is to create a "dummy key" and get permission by the vehicle to register new SmartKeys.

Features in this section are suitable to use on Toyota/Lexus vehicles.

The learning procedure consists of the two steps:

- Make the dummy key (emulator)
- Register new SmartKey(s)

#### Connecting to a Car

At this point it is assumed that the Pass Thru adapter is installed and properly selected.

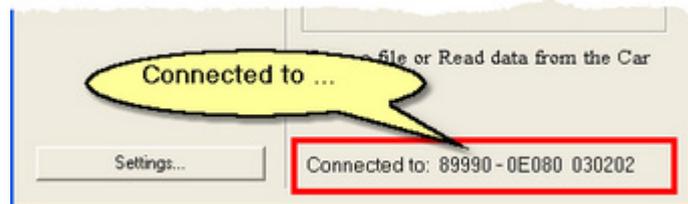
See Pass Thru adapter settings

In order to connect to a car proceed with the following steps:

- Connect the Pass Thru adapter to the vehicle and to a PC
- Connect Tango to the PC
- Run the Tango+ Toyota.exe (double click on the icon, or start from Tango main software)
- Click the **Connect to Car** button



After the successful connection the text with the target unit name will appear:



*On some old versions of ECU the PartNo. may be empty*

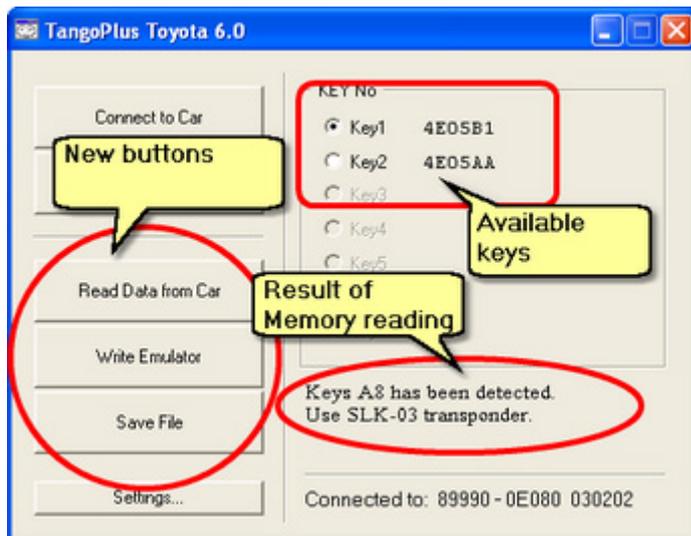
If all is correct, the new button **Read Data from Car** will become available:



### Reading of Memory

Click the **Read Data from Car** button and wait until the process is finished.

After the software successfully reads the vehicle's memory, the result displayed will look similar to the example shown in the picture below:



The text Use **SLK-03** informs about the type of the emulator suitable for the car.

Additionally two new buttons **Write Emulator** and **Save File** will appear (see picture).

## Writing of Emulators

Place the emulator of the type shown in the result string into Tango. Select any of available keys and click the **Write Emulator** button. List of various types of emulators can be found in section SLK Transponders of the current document

## Registration of New SmartKeys

There are many diagnostic software in the world that can learn new keys. This procedure is outside of our software and is a subject of customer's choice.

To enter the Registration procedure at least one valid SmartKey is necessary. After the learning software asks you for the valid SmartKey, show him the written emulator instead of the original car's key. **The emulator created in the previous step serves to authenticate Registration procedure.**

## File saving

This is an optional feature and is not necessary for key making. The read data may be saved as a file. The file may be loaded to the software using the **Open File** button, that is available without a car. After the loading the standard interface for writing of emulators will appear. Use the **Save File** button to save the read data and **Open File** to involve it.

# Immobilizer Systems

## G- and H-Type (80/128bit)

### Preface

The main idea of this software is to bring the immobilizer memory to the primary condition, also named "after sale". Having the primary state, the immobilizer is able to learn new keys.

The learning procedure consists of the two steps:

- Reset immobilizer
- Learn new key(s)

After the Reset Immo has been done you are able to learn the new key(s).

### Reset Immobilizer and Learn New Key flow chart

1. Connect to a car
2. Reset an immobilizer
3. Register new key(s)

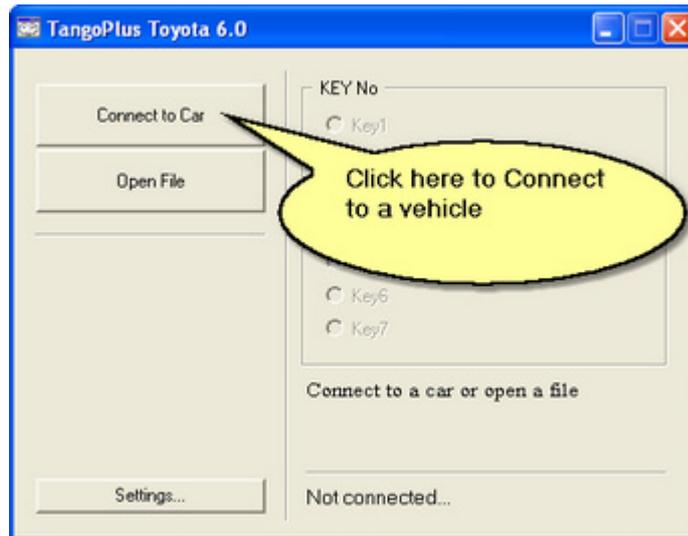
### Connecting to a Car

At this point it is assumed that the Pass Thru adapter is installed and properly selected.

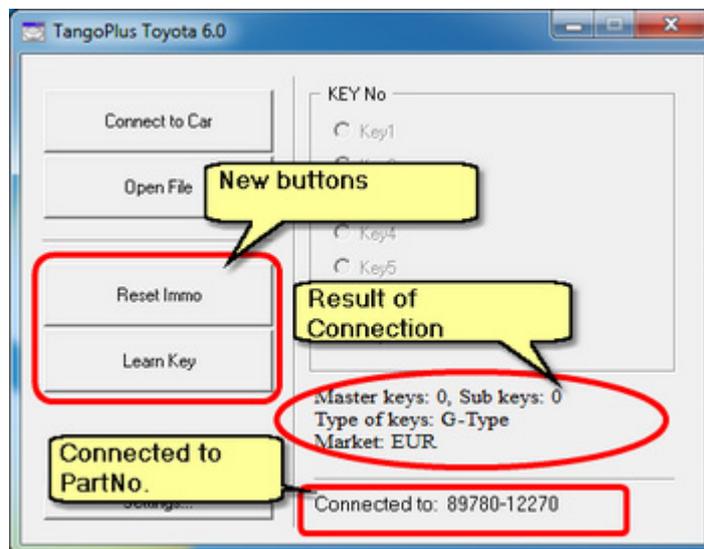
See Pass Thru adapter settings

In order to connect to a car proceed with the following steps:

- Connect the Pass Thru adapter to the vehicle and to a PC
- Connect Tango to the PC
- Run the Tango+ Toyota.exe (double click on the icon, or start from Tango main software)
- Click the **Connect to Car** button



After the successful connection the new buttons and the text with the target unit name and immobilizer data will appear:



### Reset Immobilizer

The **Reset Immo** button will be available after a successful connection.

**Clicking the button you lose all key data from the immobilizer.**

After the procedure finishes the immobilizer is ready to register new keys. Key

5. Finish the procedure switching ignition ON-OFF five (5) times in quick succession (using a Master key) while all doors are closed.

**Not all H-Type Europe immobilizers can be reset with the current version of the software (V6.0)**

### Key Registration

There are two different situations. Each of them requires a different approach to key learning.

The first of them is a case of having no keys at all, the second is having at least one valid master key.

**Case 'No keys'**

The following procedure brings an immobilizer to the self-learning state, that allows to assign three keys (two master-keys and one sub-key). Please note that the first learned key must be the master-key.

- Reset immobilizer
- Learn a new key

1. Insert a key into the ignition key cylinder and turn ignition ON
2. Click the **Reset Immo** button. In case of success operation the "OK" message will displayed.
3. Switch ignition OFF and remove the key from an ignition lock.
4. Insert a master key into the ignition key cylinder and turn ignition ON.
5. Click the **Learn Key** button. [security indicator is SOLID]
6. Switch ignition OFF and remove the key from the ignition lock. The key is learned.
7. Insert a next master key to the ignition lock. Do not turn ignition ON. Remove the key. The key is learned.
8. Insert a sub key to the ignition lock. Do not turn ignition ON. Remove the key. The key is learned.

If not all three keys necessary, it is possible to finish the learning procedure at any time. Switch ignition ON-OFF five times, it forces an immobilizer to end learning.

### **Case 'Have a Master Key'**

1. Insert a Master Key into the ignition key cylinder and turn ignition ON
2. Click the Learn Key button.
3. Within 10 seconds:
  - Switch ignition OFF and remove the Master Key.
  - Insert a key that needed to be learned to the ignition lock. Do not turn ignition ON.

If 10 seconds had been elapsed before the new key had inserted to the lock, the procedure finishes with an error. The security indicator is blinking like "no key detected". Wait for about 2 minutes. The indicator stops blinking. The key is learned.

## **40bit Type**

### **Preface**

The main idea of this software is to bring the immobilizer memory to the primary condition, also named "after sale". Having the primary state, the immobilizer is able to learn new keys.

The learning procedure consists of the two steps:

- Reset immobilizer
- Learn new key(s)

After the Reset Immo has been done you are able to learn the new key(s).

When an ignition key is inserted into the ignition cylinder, the immobilizer registers the key.

In this mode, a maximum of 4 keys (3 master and 1 sub) can be registered.

Any order of registration for the masters and subs is OK because immobilizer can distinguish the types of keys.

## Reset Immobilizer and Learn New Key flow chart

1. Connect to a car
2. Reset an immobilizer
3. Register new key(s)

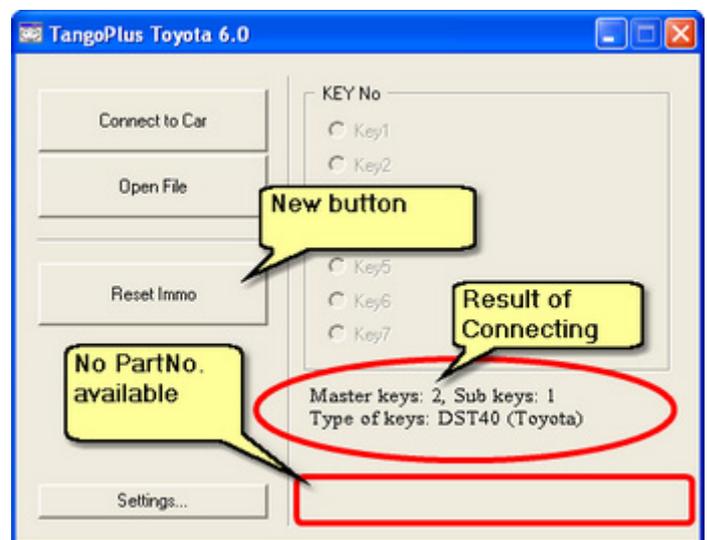
### Connecting to a Car

At this point it is assumed that the Pass Thru adapter is installed and properly selected.

See Pass Thru adapter settings

In order to connect to a car proceed with the following steps:

- Connect the Pass Thru adapter to the vehicle and to a PC
- Connect Tango to the PC
- Run the Tango+ Toyota.exe (double click on the icon, or start from Tango main software)
- Click the **Connect to Car** button



After the successful connection the text with key data and a new button will appear

### Reset Immobilizer

The **Reset Immo** button will be available after a successful connection.

**Clicking the button you lose all key data from the immobilizer.**

After the procedure finishes the immobilizer is ready to register new keys.

### Registration Flow Chart

Start position: security indicator is **BLINKING**

1. Insert the key into the ignition key cylinder (the indicator becomes ON)
2. Wait until registration complete (approx. 1 second, the indicator becomes OFF)
3. Remove the key (the indicator becomes ON)
4. Repeat 1-3 for other keys (if it is needed)
5. Finish the procedure switching ignition ON-OFF five (5) times in quick succession (using a Master key) while all doors are closed.

