



BlackBox controller

Quick start guide

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Introduction

BlackBox controller is a powerful device for programming joystick controls. Configuration utility saved in *VKBDevCfg.exe* file allows to set up a lot of functions. To do so you must be familiar with this program. The most common functions of configuration are:

- ▼ firmware upgrade,
- ▼ user profile save and load,
- ▼ getting current controller parameters,
- ▼ setting new parameters to controller,
- ▼ axes calibration.

Up-to date versions of configuration utility (configurator), firmware files and firmware upgrade tool *Z-Bootloader.exe* you can find at VKB site: <http://vkb-sim.pro/support/software/>.

Chapter 1. Configuration utility use

1.1. User interface

After you run configurator you will see its window (fig. 1.1). Title bar contains version of the program.

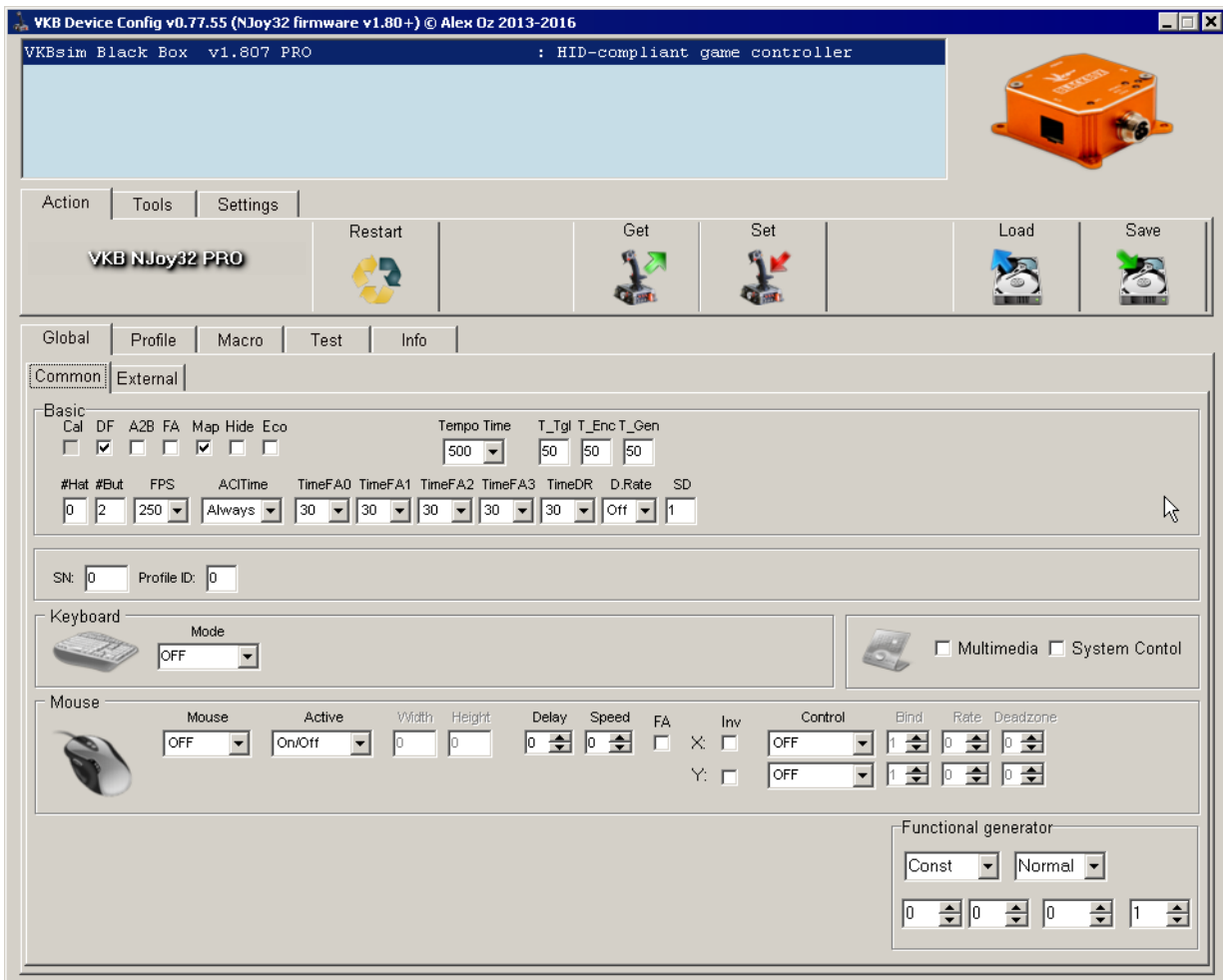


Fig. 1.1.

All connected VKB devices are listed in this window. You can see version of device firmware close to its name. To set up device parameters you must select its name in the list.

1.2. Firmware upgrade

First of all do the following actions.

1. Download archives:

- ▼ Firmware upgrade utility *ZBootloader-C.rar*
(<http://ftp.vkb-sim.pro/Programms/zbootloader-c.rar>),

- ▼ Configuration utility *VKBDDevCfg-C_XXX.zip*, where XXX is version number from this locaiton <http://vkb-sim.pro/support/software/>.
 - ▼ Firmware file *_BlackBox_vXXX.vkb*, where XXX is version number from this locaiton <http://vkb-sim.pro/support/firmware/>.
2. Unpack downloaded archives in the same folder and save firmware file in the same folder.

1.2.1. Upgrade activation

1. Connect controller to the PC.
2. Run *VKBDDevCfg-C.exe*, select joystick name in the list (fig. 1.1 on p. 6).



3. Press **Bootloader** button on **Tools** tab.

You will see firmware upgrade utility window (fig. 1.2)

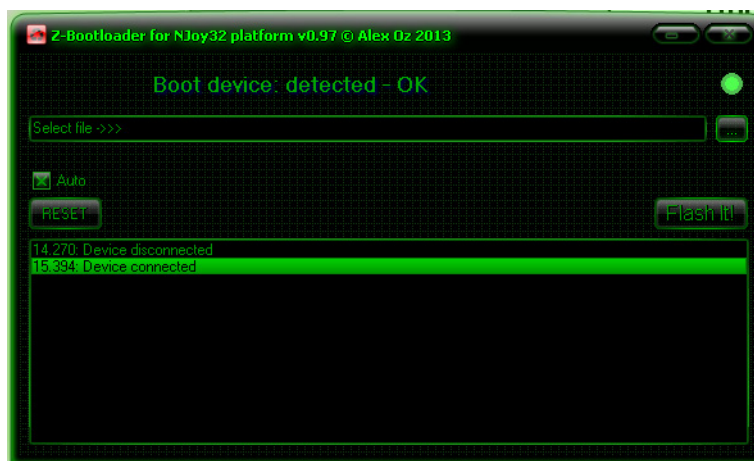


Fig. 1.2.



When *ZBootloader-C* runs, configurator window will be closed automatically. If it still for any reason runs, close it manually. Configurator and *ZBootloader-C* must NOT run simultaneously!



4. Press **Browse** button and select firmware file in standard Windows dialog.

You will see its name in dialog.

5. Press **Flash It!** button.

Some information messages will appear in utility window. After successfull upgrade utility window will be closed automatically. *VKBDDevCfg-C.exe* will run automatically. You will see device name with new version number.



Some versions of firmware reset controller parameters to default values. If you have made custom settings of controlller parameters save you profile to file. After firmware upgrade you can load your custom profile (see section 1.4 on p. 10).

1.3. Axes calibration

1.3.1. Autocalibration

Usually you can calibrate joystick axes automatically. Do the following actions.

1. Check **CI** option on **Profile – Common-n-Axes – Physical Axes** tab for axes which must be calibrated.
2. Push **Start Calibr** button on **Tools** tab.



Lightning mode of system LED will be changed.



3. Rotate every calibrating axis between extreme positions.
4. Push **End Calibr** button.



If for some reason you want to cancel calibration without saving results, push **Cancel Calibr** button.

1.3.2. Manual calibration

In some cases the results of autocalibration may be insufficient. For example values of **KdHi** и **KdLo** may be equal to 255. Such values are too great and desensitize axis precision (best results are with values about 120 — 180). Or neutral position of the grip does not correspond with the middle of the response range. In this case it is recommended to perform manual calibration. To make this operation you must use VKB Joytester. Download it from VKB site http://ftp.vkb-sim.pro/Programms/VKB_JoyTester.zip. Unpack downloaded archive in the same folder with other VKB utilities.

Joytester interface

Run *VKB_JoyTester.exe* file. The window of this utility is shown in fig. 1.3.

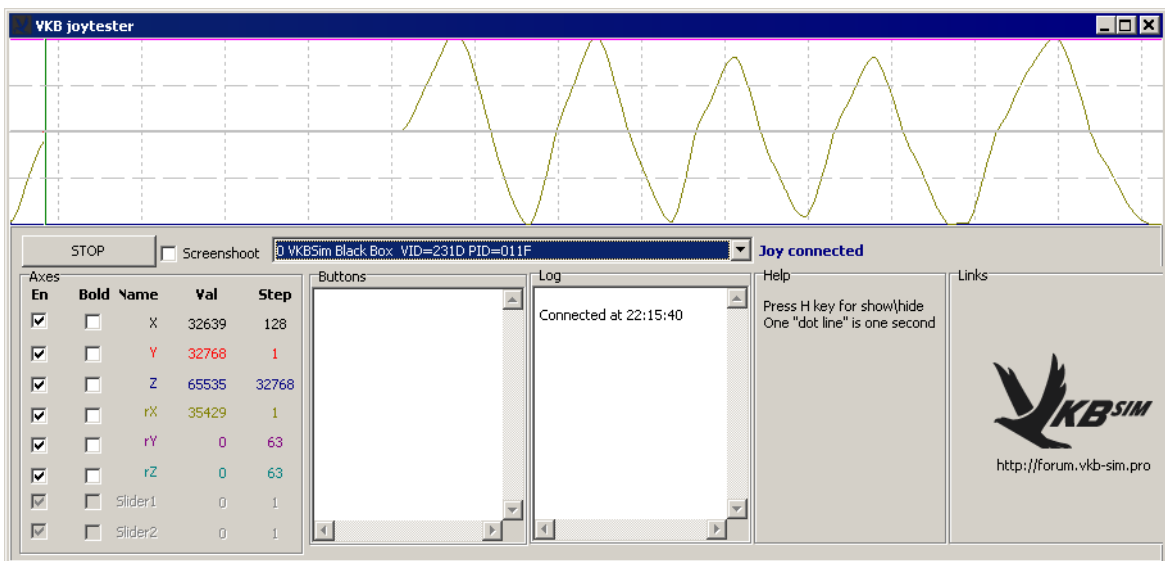


Fig. 1.3.

Select joystick name in **Joy connected** combobox. The most window area occupies axes response diagram. When you move grip, you will see graphic response and its digital value.

When you push buttons you see their numbers in **Buttons** field.



If special function (i.e. Shift or Fix Axes etc.) assigned to the button, you will not see its number.

Centerpoint adjustment

If you have connected your pedals to BlackBox yaw axis by default will have Rx name. It has centerpoint. Thus when you release pedals response value of this axis must be equal to 32767 (one half from 65535, maximal value). Inaccuracy in some digits or even tens are acceptable. But if it is too big and centerline of the axis does not match with graph center line, you must correct calibration. **Bias** parameter allows to compensate magnet and MARS positions for digital axis or potentiometer centering for analog one. Try to change **Bias** value about 100 — 150 units with + or - sign and press **Set** button on **Action** tab. Centerline position will be changed. Select such **Bias** value that when the grip stays in the center position response value is about 32767. Do not forget to push **Set** button every time you have changed **Bias** value.



Set button allows to write current settings into controller memory. BlackBox does not need to run any software to work. All settings are stored in its memory. **Get** button allows to read controller memory. You can use this button, for example, if you have made some changes of parameters but decided not to apply them (**Set** button was not pressed). In this case you can simply disconnect joystick from PC, but easiest way is to press **Get** button and so reread current parameters.

Axis response range correction

Setup axis response range so in pedals extreme positions response value will be equal to 0 and 65535. **KdHi** and **KdLo** values must be in range 100 ... 180. This will provide optimal dynamic range.

Push pedals between extreme positions. If response value is greater than 0 or less than 65535 or, on the contrary, the pedal is not in the extreme position but response value already is equal to 0 or 65537, you must correct the range.

Change **KdHi** value, press **Set** button, move the grip and check how axis response value in the extreme position has been changed. Select such **KdHi** value that when the grip is in extreme position response has extreme value too. If you change **KdHi** value but can not reach a goal (value is out of range 100 ... 180), try to change **MPL** value and repeat setup. Then you must setup the other range limit with the same manner, changing **KdLo** value.



While you setup response range, centerpoint can be moved. In this case setup it again.

Calibrate all axes (if it is needed) in the same manner.

1.4. Saving parameters

If you are experienced user and want to get maximum benefits from your joystick, you will thoroughly tune it. Saving current parameters into the file must be the rule for you. For example if you will upgrade firmware, all your settings will be lost, because controller will be reset to default conditions. **Save** button on **Action** tab allow you to save parameters to file. After you press this button, choose the folder and set file name in standard Windows dialog window. By default configuration file name extension is *cfg*. Do not change it.

1.5. Loading parameters

If you have saved controller parameters into file using **Save** button you can load them into controller memory again and again. To do so press **Load** button. Open folder and select configuration file with extension *cfg* in standard Windows dialog window. After that you will see controller parameter values, loaded from the file in configuration utility window. It means **nothing** until you press **Set** button on **Action** tab.

