

R/C TANK MULTIFUNCTIONAL MODULE

The IBU3 module is a totally new board, based on experiences with IBU2, it offers superior performance combined with flexibility and ease of use.

The IBU3 module completely replaces the electronics present in the RC Tank, allowing to fight according to the IR Tamiya standards, customize all the sound effects and use a proportional radio from 4 to 8 channels (AM, FM, or 2.4 GHz) for full tank control.

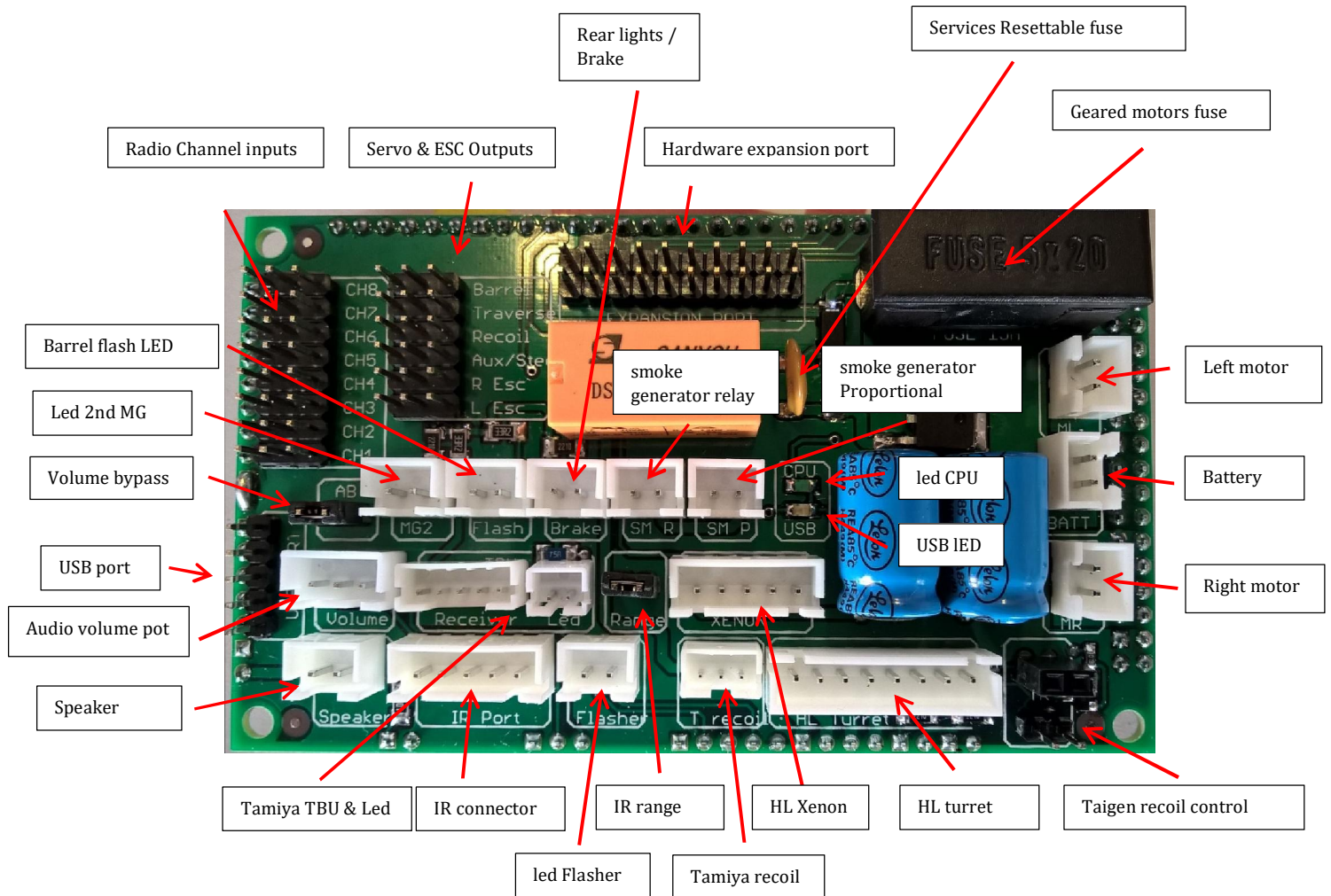


USER MANUAL

MAIN FEATURES

- Plug & Play with Heng Long models, Torro and Taigen
- ESC integrated for Tracks Control
- 6 pre-calibrated selectable inertia curves, with the possibility of customization of the curve
- Battery Management Li-Po (2 or 3 cells), Ni-Mh 6 or 8 cells), Lead (12V) with audible and visual warning of low battery
- fully configurable servo support (normal and 360 °) for barrel control, traverse turret, recoil , auxiliary (speed, direction, ATV, neutral point)
- support for external tracks ESC
- Two outputs (LEDs) MG selectable via remote control with flashing synchronized with the sound effect
- Output for smoke generator proportional to the engine rpm
- Output for smoke generator ON/OFF (relay) for TARR Smoker heaters
- Direct control for Xenon module (Heng Long / Taigen)
- Dedicated outputs for Tamiya Battle System and recoil mechanism
- Direct control of standard HL/Taigen recoil /airsoft
- Control output for Taigen servo recoil
- Visual indicator output (if not using an IR receiver with integrated LED, Tamiya/Impact)
- Output for high-intensity LED (barrel flash simulation)
- Output for rear lights and brake lights (led)
- Power audio output D-Class (10 Watts @ 8 Ohms, 15W @ 4 Ohm)
- Adjustable audio volume control by remote control
- USB port and free downloadable PC application for uploading sounds, configuration, testing, user-installable software upgrades
- 16 Mbytes of Flash memory for sound effects, no limit to the length of the audio tracks (limited to free memory space)
- audio samples in .wav format, 16bit, 22.0050 KHz
- Audio samples .ibu format for free download
- 8 engine sounds, customizable dynamic sound management
- 4 turret sounds , cannon, MG1, MG2, 5 mechanical noises, 2 hit sounds (random logic), tank destruction, rebirth
- 4 optional sounds selectable by remote control
- Audible alerts: Start system, low battery, empty battery, inactivity (transmitter or IBU3 module)
- Intelligent remote control calibration with acquisition and automatic matching of channels-to-function with test page
- Compact size 100 x 60 x 25 mm. (approx.. 4" x 2,5" x 1")

IBU3 MODULE LAYOUT



CAUTION

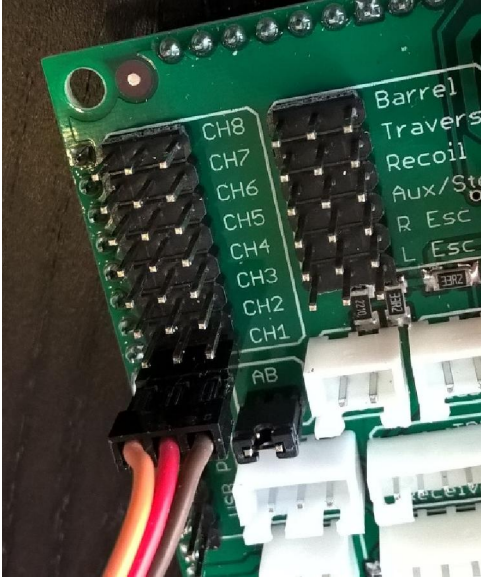
In order to avoid faulty operation, follow the instructions described below

Do not connect anything to the expansion connector, it is dedicated to additional modules (when available)

Risk of permanently damaging the IBU3 Module

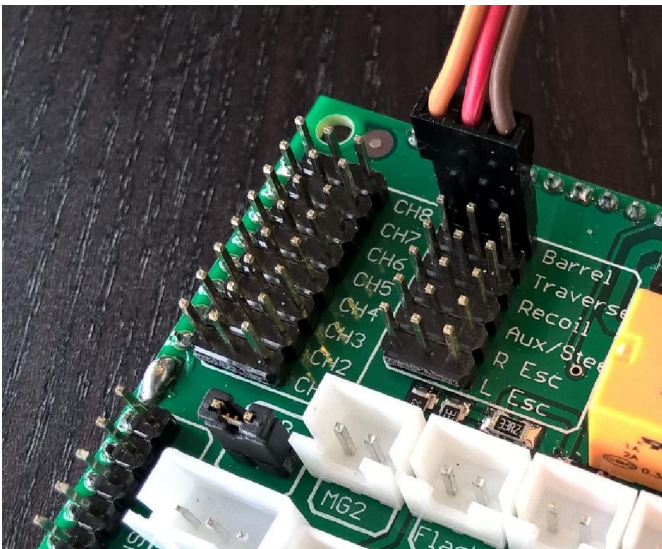
In case of failure to comply with these instructions no warranty will apply

IBU3 MODULE CONNECTIONS



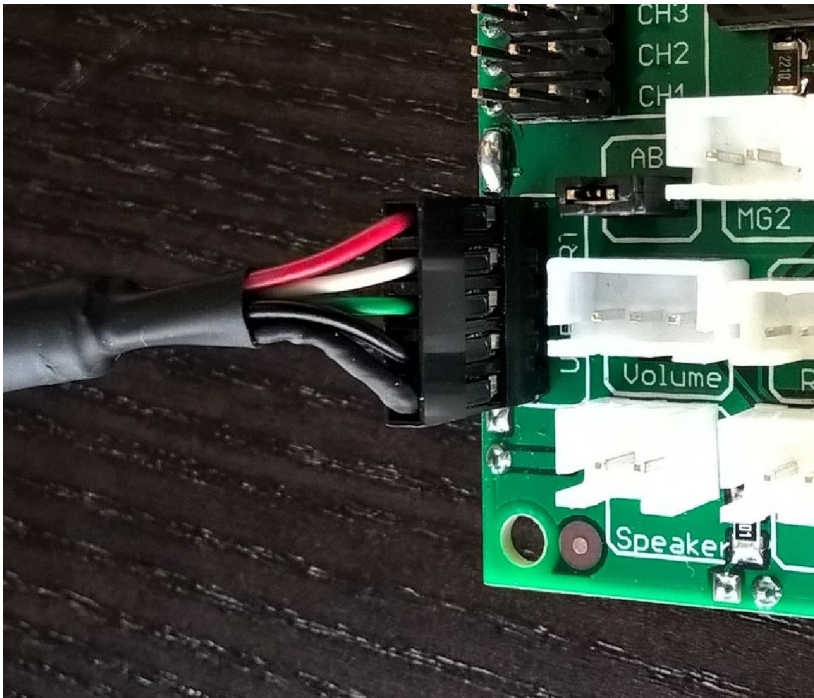
Connect receiver channels receiver as shown in the figure, the polarity of the signal (orange) is turned towards the outer edge of the module IBU3

(For clarity only the first channel is connected)



Connect the servos as shown in the figure, the polarity of the signal (orange) is facing the receiver connector

(For clarity only one servo is connected)



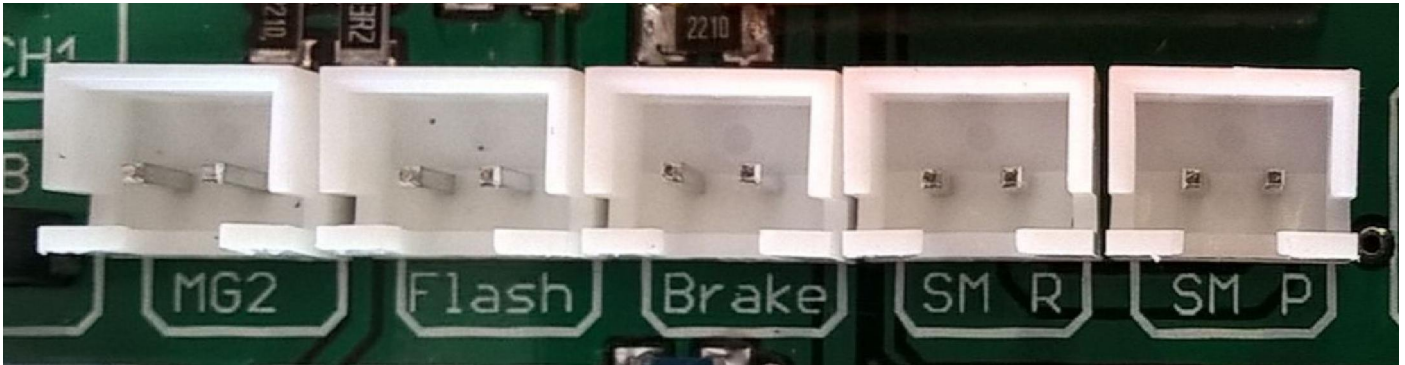
Connect the USB cable (supplied in the package) as shown in the figure.



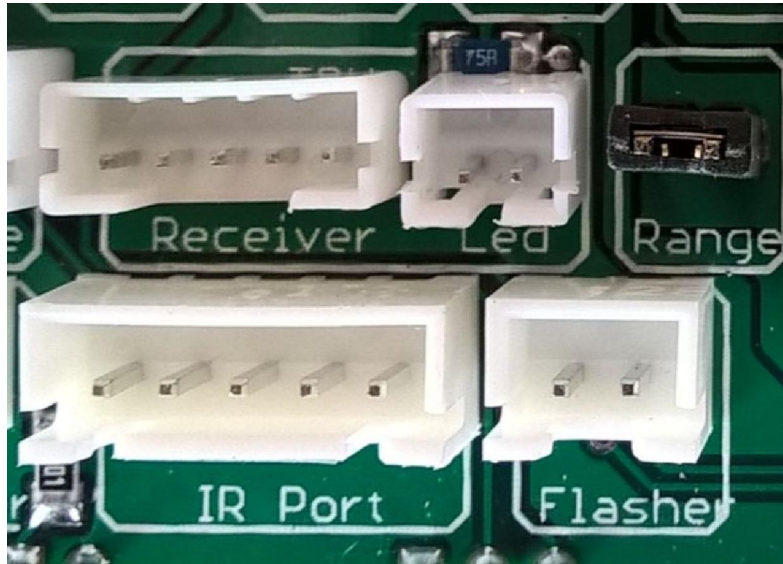
If you intend to use the volume pot remove the AB bridge and connect the cable to related connector.

If using the remote volume control (using one radio channel, see the section in IBU3 Configurator) you can omit the volume control, in this case the AB bridge must be inserted.

Connect the speaker to the speaker connector, it is recommended, in order to avoid sound distortion, to use a good quality speaker, not less than 8 watts with an impedance of 4 or 8 ohms.



- **MG2**
The connector allows you to connect a LED to simulate the flash of the 2nd MG barrel (which is selectable by a radio channel, see the section IBU3 Configurator). The light output is synchronized to the reproduced audio sample.
- **Flash connector**
The IBU3 module allows you to connect a high-brightness LED flash to simulate the gun muzzle flash. Connect this output to a high-brightness LEDs.
- **Brake connector**
The module allows you to connect two leds (in parallel) to be used as taillights and simulating the brake lights (if the braking simulation function has been activated, see the section in section Configurator IBU3).
- **SM R connector**
The IBU3 module allow to use a smoke unit such as TARR Smoker or similar who have cables for the separate heating resistor. Connect this output to these cables. **(Maximum relay load = 3 amps)**
- **SM P connector**
Output proportional to motor speed, connect to this output a standard HL/Taigen smoke generators, or the fan of the TARR unit



- Tamiya TBU connectors
The IBU3 module allows you to use Tamiya IR unit without changes.
Connect the IR receiver cable to the receiver connector and the LED to LED connector
- IR Port Connector
Connect the IR cable (Heng Long/Taigen) to this connector
- Range jumper
If you have selected (in the Misc Configuration page of the IBU Configurator) the Recovery tank type you must remove this jumper to reduce the range of the IR beam to about 1 meter.
- Flasher connector
If you are not using an IR receiver with integrated LEDs (Tamiya or Impact) you can connect one or more LEDs (in series / parallel) to have a visual feedback of the standard battle signals (hit, wagon).
If the Extended Signalling (on the Misc Configuration page of the IBU Configurator) are enabled you will be able to view additional status messages



One Flash = inertia and smoke generator on / off



two flashes = battery warning



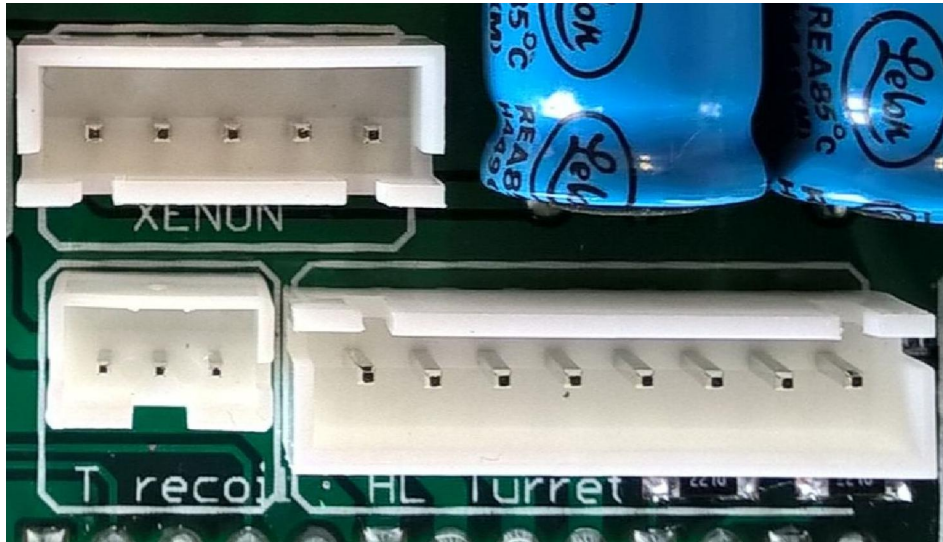
three flashes = overcurrent warning



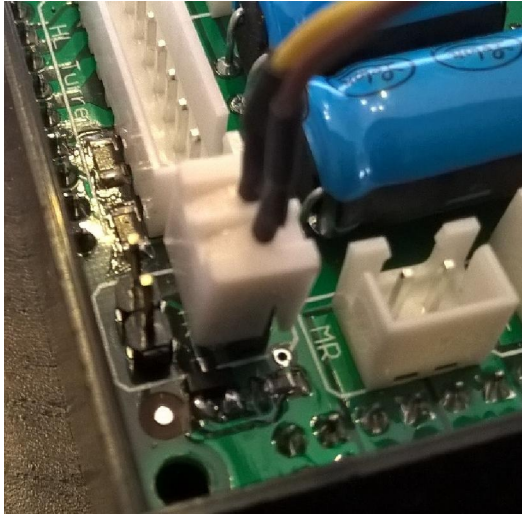
Four Flashes = lack of radio signals



five flashes = overtemperature warning



- XENON connector
Connect the cable from HL/Taigen Xenon module
- T Recoil connector
The IBU3 module allows you to control the Tamiya recoil unit without changes by connecting the cable to this port
- Heng Long/Taigen turret port

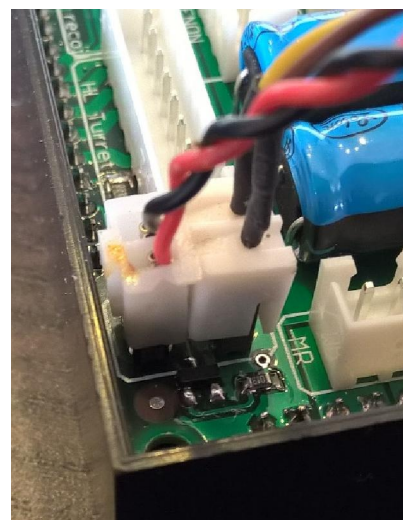


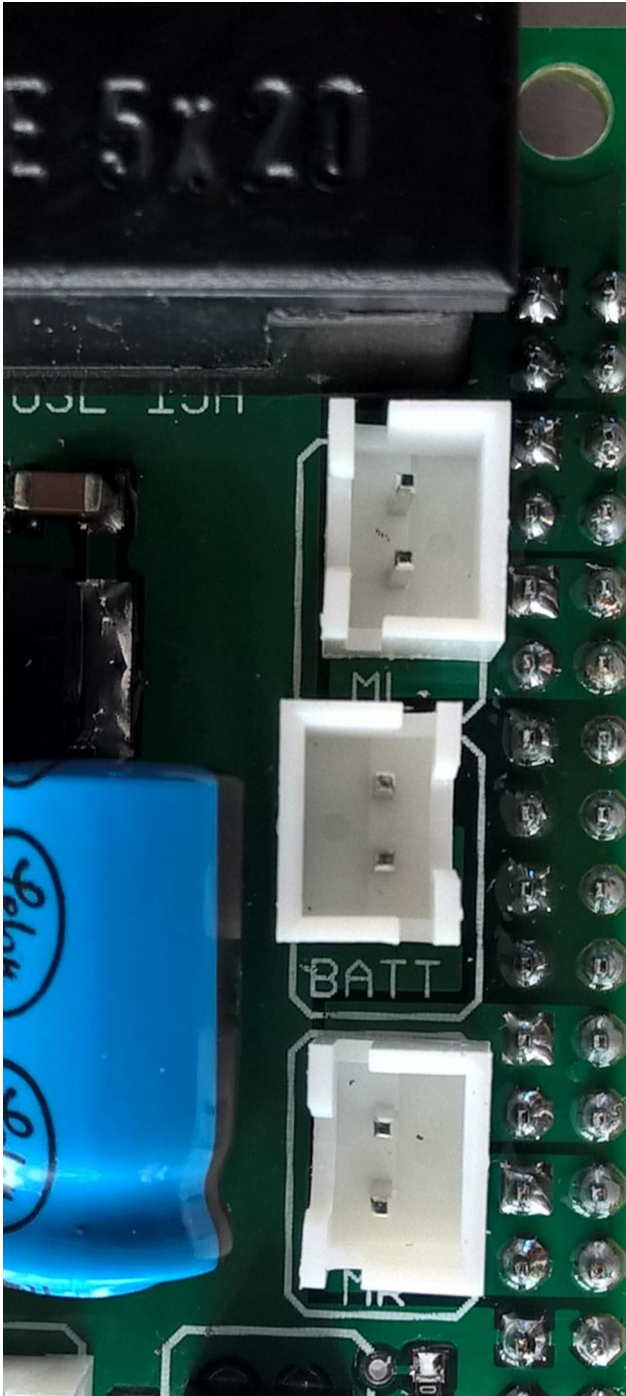
Taigen recoil connector

The IBU3 module allows to drive the new Taigen recoil units for airsoft tanks without changes.

Connect the power cable (male) to the female connector as shown in Figure

Connect the signal cable (female) to the connector male as shown in Figure





- ML connector
Connect the Left motor
- BATT connector
Connect power from the battery
- MR connector
Connect the Right motor

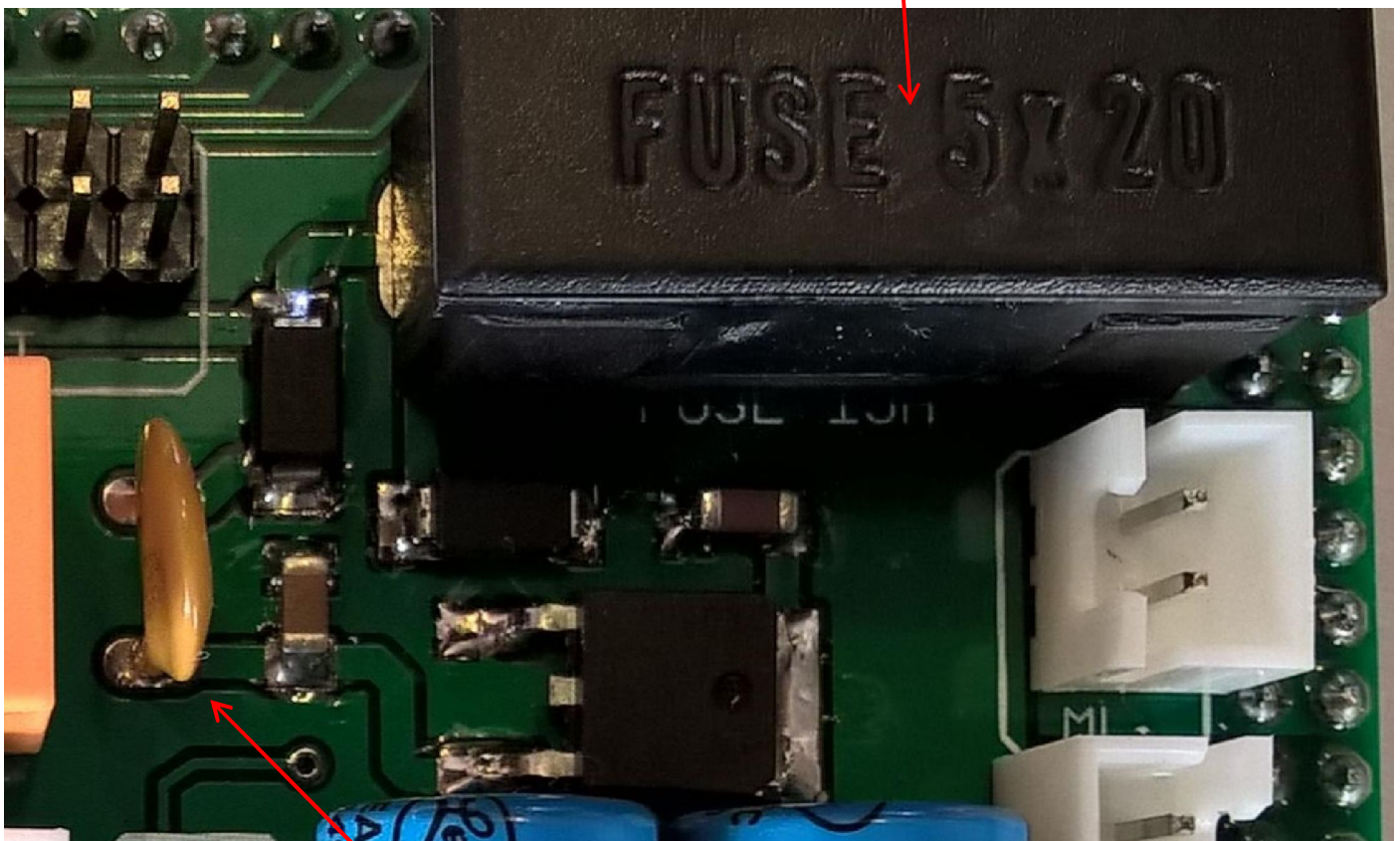
HARDWARE BUILT IN PROTECTIONS

The IBU3 Module is equipped with internal protections.

The 16 Ampere 5x20 Fast Action Fuse (which is the only part serviceable by the user) protects the powertrain

The PTC Resettable fuse (service fuse) protects the all the electronics, in case short circuit or wrong connections this fuse will disconnect the main supply coming from battery. After a short time this device will reset itself automatically and the electronics will be supplied again. If the fuse act again disconnect all the cables from the module (except for the battery supply) and check carefully the wirings.

Geared motors fuse



Service Resettable fuse

IBU3 CONFIGURATOR

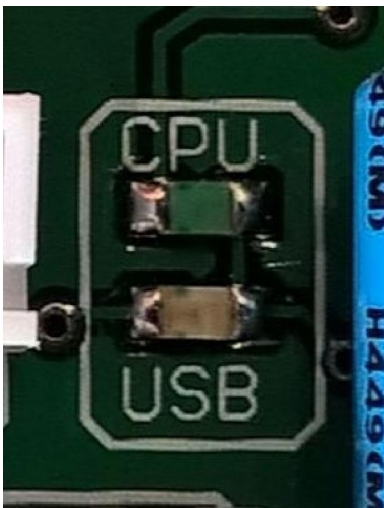
To best use the PC application in combination with the IBU3 module you should follow the instructions below.

- Minimum system requirements, Windows 7 or higher, make sure that you OS is updated to latest version
- Download the PC Configurator software and install it on the PC in use
- During installation you may be asked to install .NET Framework components for Windows, this will be done automatically but requires active internet connection
- Download the VirtualComPort drivers and install them on the PC in use
- Connect the female USB adapter cable(provided) to IBU3 module
- Connect your PC to IBU3 module using a USB cable Male / Male Type A (not supplied)

CAUTION

despite the USB port of IBU3 module is protected against short circuits is recommended to connect to the PC usb ONLY with IBU3 module switched off

- Power the IBU3 module
- the green LED on the CPU module flashes for a few seconds during the self-test after which it is steady
- The USB yellow LED on (if the module is connected to the PC)
- Run the IBU3 Configurator

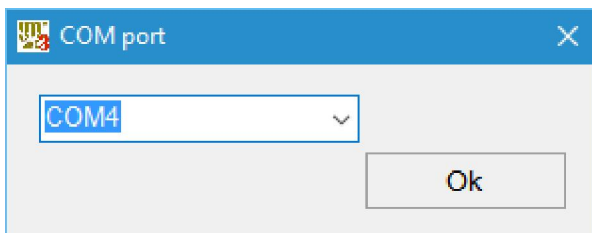




Main page

- **settings**
Access to the configuration of the IBU3 module
- **Test**
Access to IBU3 module test program
- **Firmware update**
Update the module with a new version of software (when available)
- **USB port selection**
PC communication port selection
- **language selection**
Switch between languages

If the IBU3 module is not connected (and powered) to the PC you can not access the above user functions.

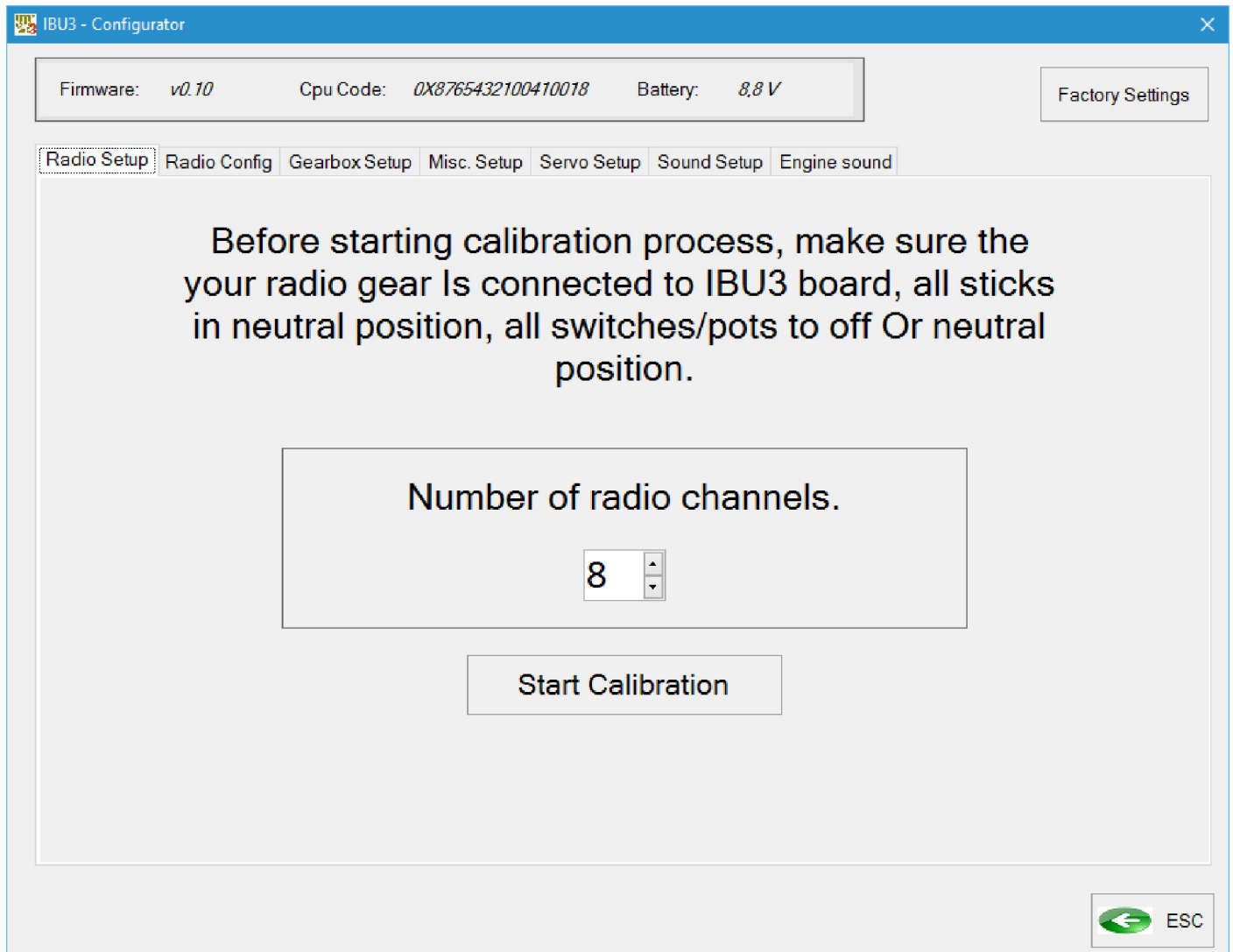


Before you access the various functions of the program you must select the PC communications port

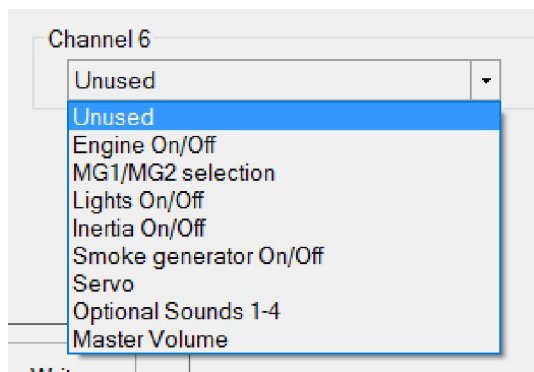
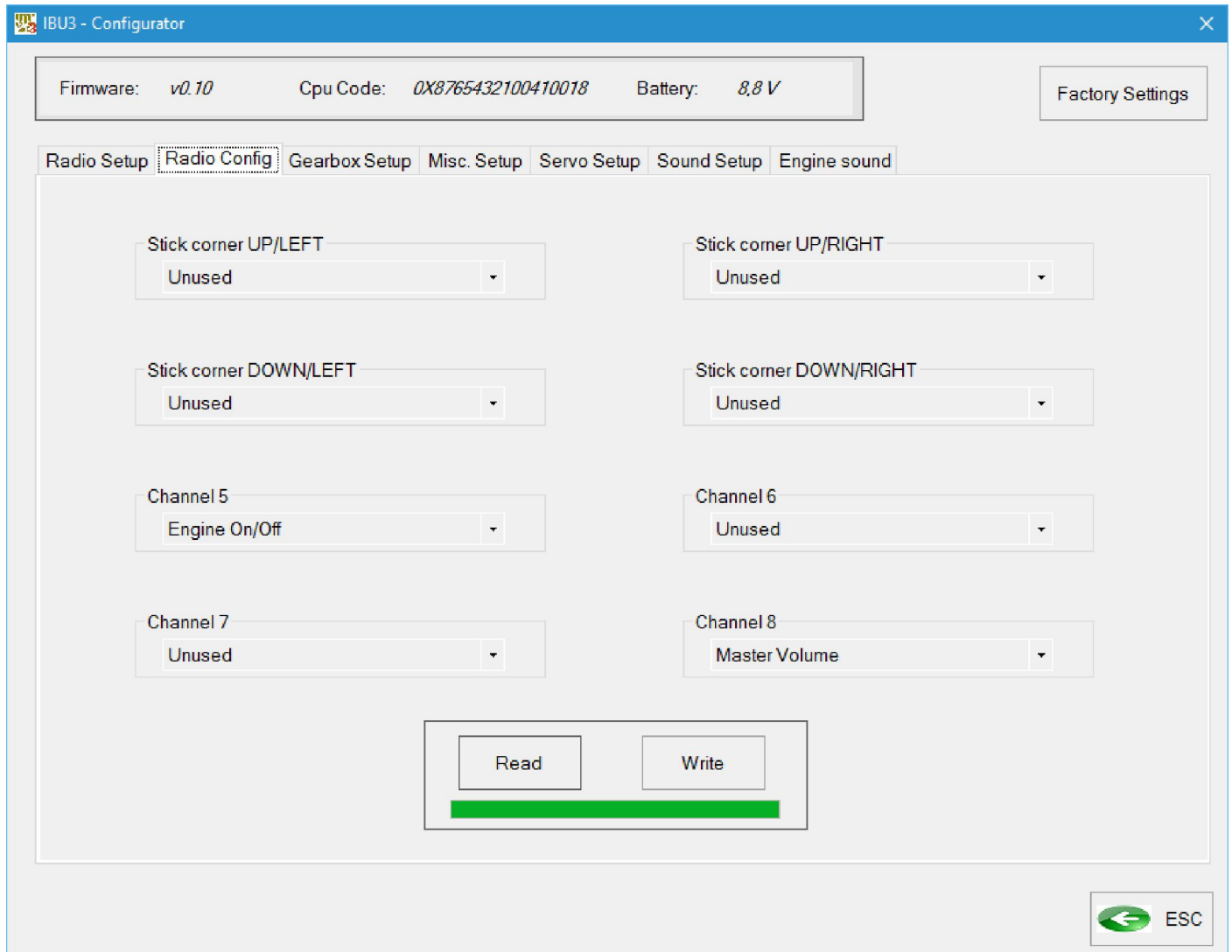
Choose from the dropdown list the communication port (in this case COM4), more ports appears available use the first proposal and, in case of failure, the next available.

RADIO SETUP

After selecting the number of channels of your transmitter press the Start calibration button and follow the instructions on the screen, at the end of the configuration it will be automatically saved in the memory of IBU3 module.



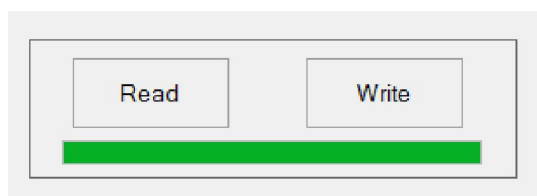
RADIO CONFIGURATION



This screen shows the example of a 8-channel radio, every function is however assignable to any channel or diagonal stick, for example:

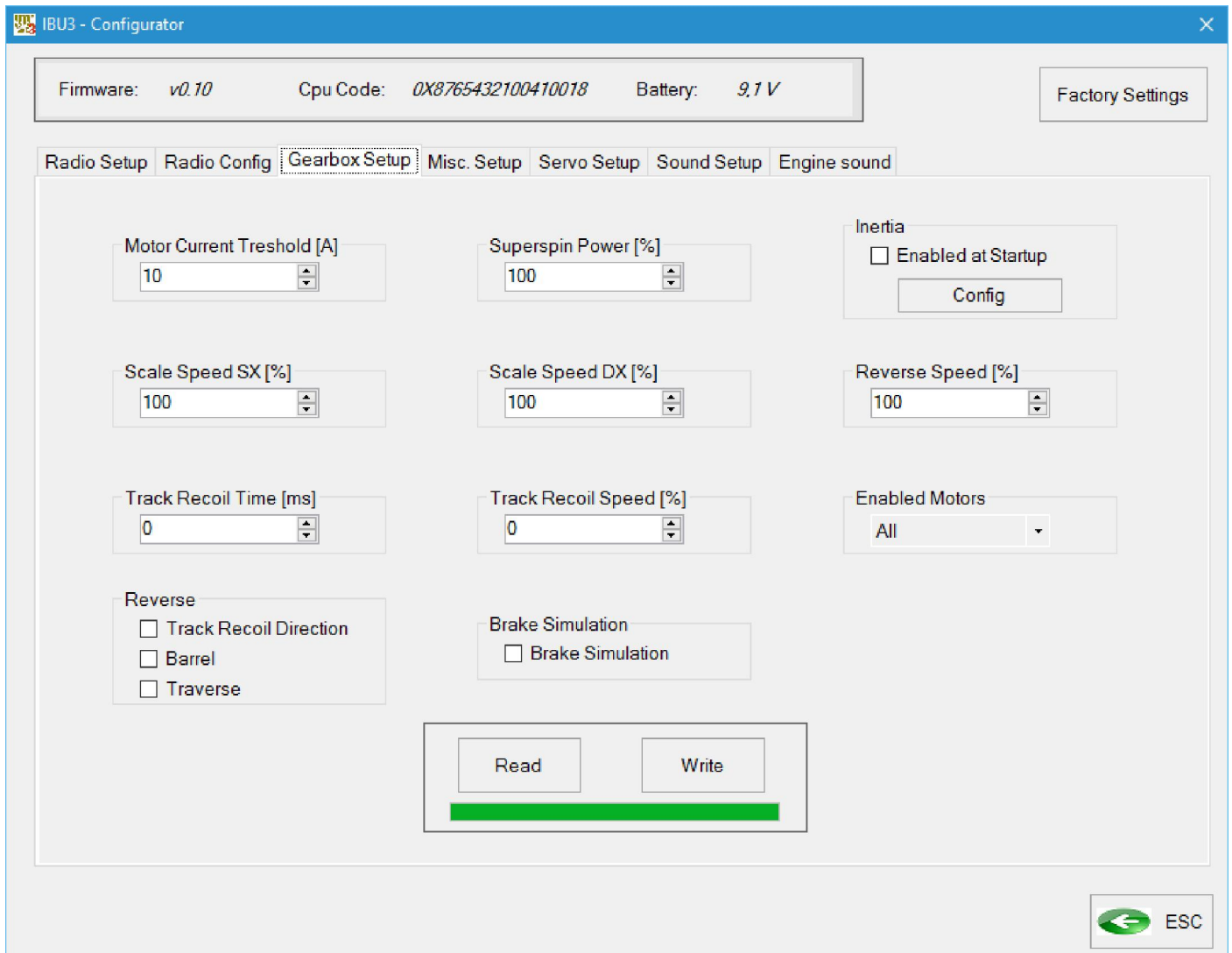
In this case, the selectable options are visible for the 6th channel from the drop down menu

All channel configurations and stick corners have the same menu options. The control options via diagonal sticks can not control proportional channels such as optional or the audio volume sounds, in this case it is always advisable to use a proportional radio channel coupled to a potentiometer or slider



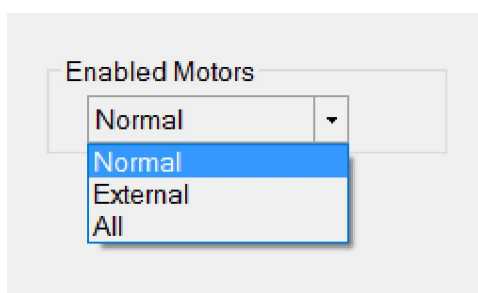
After configuration save the settings by clicking on the command write

GEARBOX SETUP



In the upper part of the page are always displayed: current firmware version, serial number of IBU3 module and the battery voltage level. The button "Factory Settings" enables a parameter reset by restoring the default settings

The first configuration page is dedicated to gearboxes , where you can set the parameters related to the maximum current, the rotational power (SuperSpin), the speed of the motors (right and left), the limitation of reverse speed. You can also set the time, the speed and the direction of simulated recoil of the tank during cannon firing.



The Motors enable configuration allows to select the control of the motors via the integrated ESC (up to 20 Ampere for each motor) or, external separate ESC (brushless or high power for 1/6 tanks).

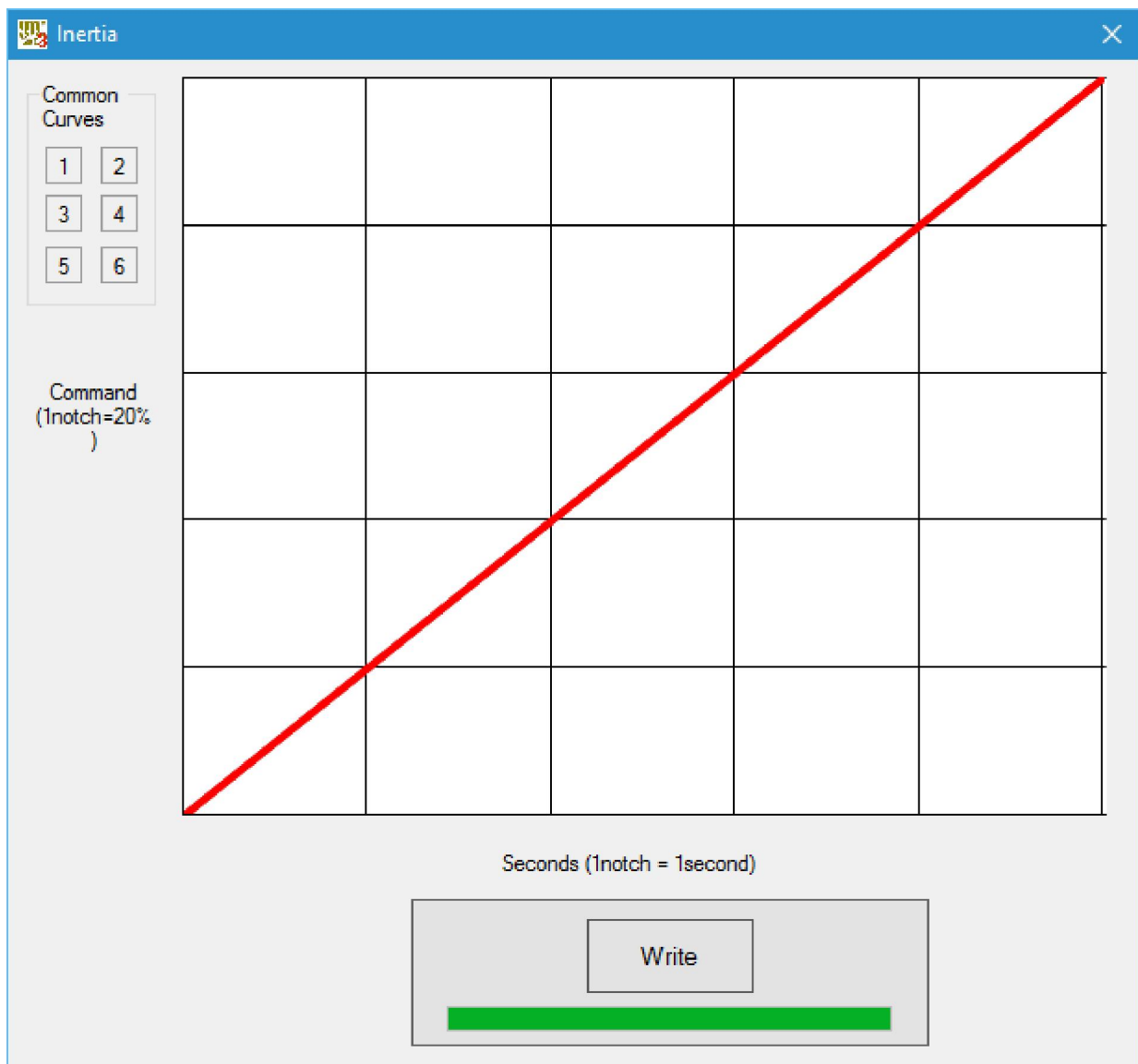
CONFIGURATION SETUP

Inertia

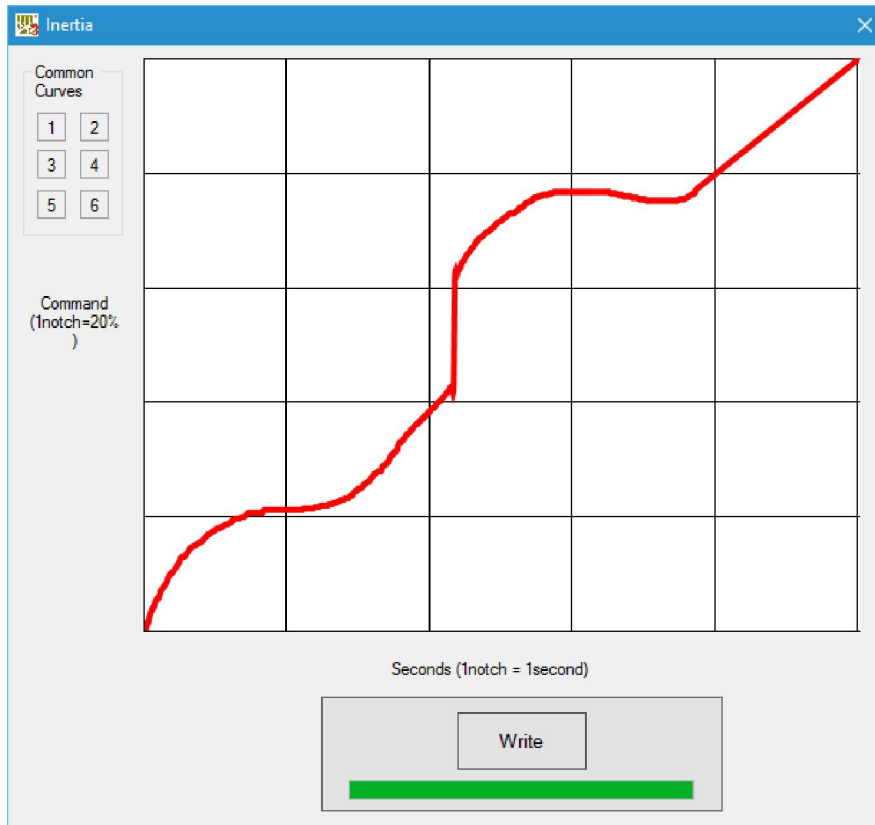
Enabled at Startup

Config

By checking the box inertia simulation will be active when you turn on the system. You can choose different curves of inertia by clicking on configuration and then choosing one of the six pre-programmed curves.



Also you can alter the curve selected according to preferences by simply clicking the mouse on the red line of the chart and dragging it to your liking. After configuration save the inertia settings by clicking the command write.



Reverse

Track Recoil Direction

Barrel

Traverse

It's also possible to reverse the direction of the Track Recoil, Traverse and Barrel gearboxes by checking the related option box

Brake Simulation

Brake Simulation

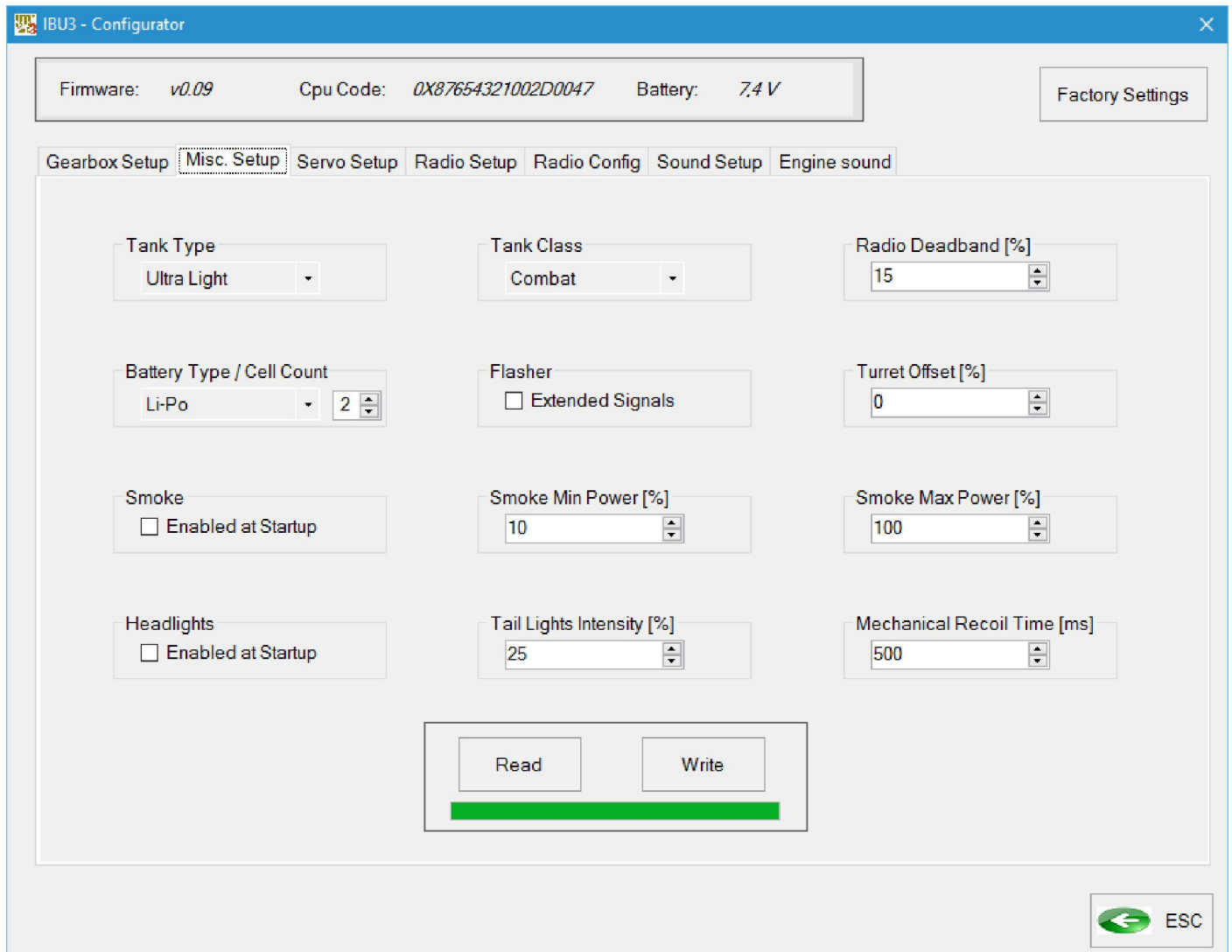
Enabling the brake simulation while driving will be possible to brake pushing the stick in the opposite direction (surpassing the neutral position) in this case the tank will brake and remain stationary until the stick will not be brought back to neutral. Also the rear lights will be lit simultaneously simulating the stops.

Read

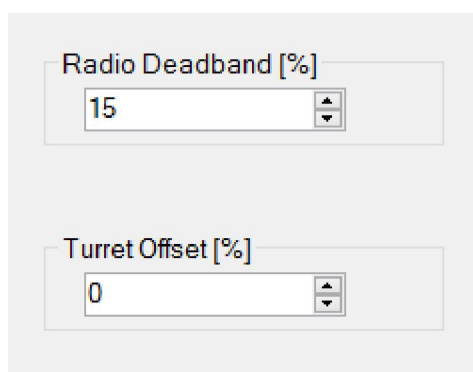
Write

After configuration save the settings by clicking on the command write.

MISCELLANEOUS SETUP



From the drop-down menu you can select: type and category of Tank, battery type and number of cells, enabling the extended signalling (Flasher) through the IR receiver led. Extended signalling include alerts for low battery, reload, low battery level, current threshold exceeded, excessive module temperature. If these reports are disabled the standard signals are still present.



In case of radio sticks neutral position stability issue is possible via this control to set a "dead zone" in which any fluctuations of the value is not considered.

In case of problems of stability in the neutral position of the turret rotation is possible to set, as for the previous option, a percentage offset within which any fluctuations are not considered.

Smoke <input type="checkbox"/> Enabled at Startup	Smoke Min Power [%] 10	Smoke Max Power [%] 100
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You can set the smoke generator ON at power up and the minimum power at idle and maximum power when run


Headlights <input type="checkbox"/> Enabled at Startup	Tail Lights Intensity [%] 25
--	--

You can set the status of the front and rear lights at power up, also by adjusting the intensity of the rear lights you will be able to have the effect of brake lights (only if the braking simulation was enabled)

Mechanical Recoil Time [ms] 500

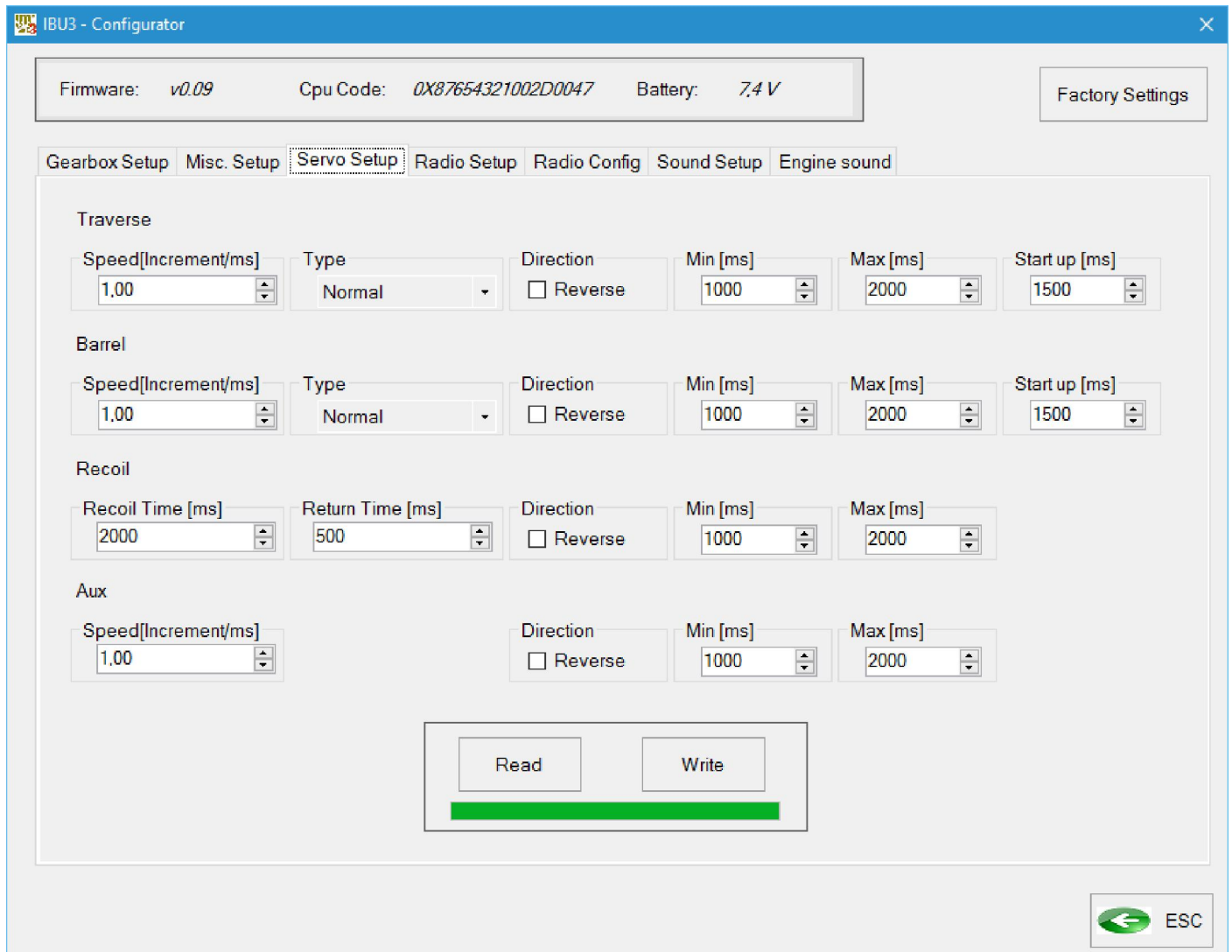
It allows you to set the pulse duration (or activation time) of the mechanical recoil group. Tamiya recoil unit can be connected to T Recoil port. The standard HL/Taigen Recoil unit (or airsoft unit) the standard HL turret connector is used.

Read	Write
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After configuration save the settings by clicking on the command write.

SERVO SETUP

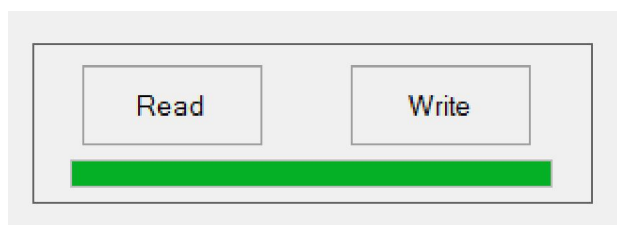


For traverse servo you can set the speed, the type of actuator, normal or 360 ° (also called continuous rotation or robotic servo), the direction, the maximum travel in both directions (ATV) and the neutral position.

For barrel servo you can set the speed, the type of actuator, normal or 360 ° (also called continuous rotation or robotic servo), the direction, the maximum travel in both directions (ATV) and the neutral position.

In Tank version the auxiliary servo can be used for an additional function (for example, open a hatch), it is controlled by a radio channel or by a diagonal (see Radio setup). It has an ON / OFF operation, and can be configured in speed, direction and (ATV)

In the future it will be released the Haltrack functionality and this servo (if selected Haltrack mode) will be dedicated to the steering.



After configuration save the settings by clicking on the command write.



USER MANUAL

SOUND SETUP

IBU3 - Configurator

Firmware: v0.09 Cpu Code: 0X87654321002D0047 Battery: 7.4 V Factory Settings

Gearbox Setup Misc. Setup Servo Setup Radio Setup Radio Config **Sound Setup** Engine sound

Engine Cold Start	Turret Sound (engine Off)	Hit Received Sound 1	Main Gun Sound	Optional Sound 1
Engine Warm Start	Turret Sound (engine On)	Hit Received Sound 2	Machine Gun 1 Sound	Optional Sound 2
Engine Stop	Barrel Sound (engine Off)	Tank Destroyed Sound	Machine Gun 2 Sound	Optional Sound 3
Engine Idle	Barrel Sound (engine On)	Tank Rebirth Sound	Low Battery Warning	Optional Sound 4
Engine Run	Mechanical Noise 1	Tank Repairing Sound	Low Battery Cut-off	
Revving	Mechanical Noise 2		System Ready	
Brake	Mechanical Noise 3			
Release	Mechanical Noise 4			
	Mechanical Noise 5			

Memory Free: 16,4 MB Delete sounds

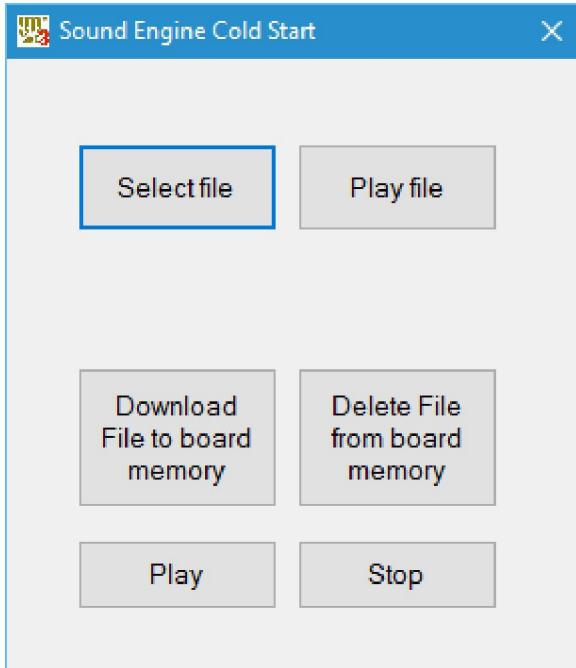
← ESC

The format of the audio files that can be used is as follows : **Audio WAV - mono - 22.050 kHz - 16 bit**

There are no restrictions in format or length of the file name, also there is not a sound file size limit, as long as you do not exceed the maximum available memory capacity, the module's physical memory is 16 Mbytes.

Also it can be used with proprietary audio file .ibu extension that are available for free download

SOUNDS MANAGEMENT



Clicking on the name of the sound you want to configure (in this case the engine cold start) displays a submenu allowing you to:

- Select the files by browsing the folders on your PC
- Play through PC speaker the selected file (.wav files only)
- Store the file on IBU3 module
- Delete the file from IBU3 module
- Play the file through the IBU3 module speaker
- Stop the audio playback from the IBU3 module

In addition to the usual audio effects are some new effects related to the functionality of IBU3 module.

"Power on" file lets you store a sound that plays when the IBU3 Module is initialized and ready to use.

The files "Battery Low" and "Battery cut-off" are two sounds played when the battery level is at the minimum, and when the safety cut-off occurs. These system sounds are very useful if you are not using the IR receiver with integrated LEDs and makes possible to get information about system status

The audio files in the Audio Setup page are not mandatory, so some may be omitted and not used, for example, if you do not want to have status indications simply don't load these sounds

Besides the usual audio files for the engine, such as:

- **Cold/hot start**
- **shutdown**
- **Idling**

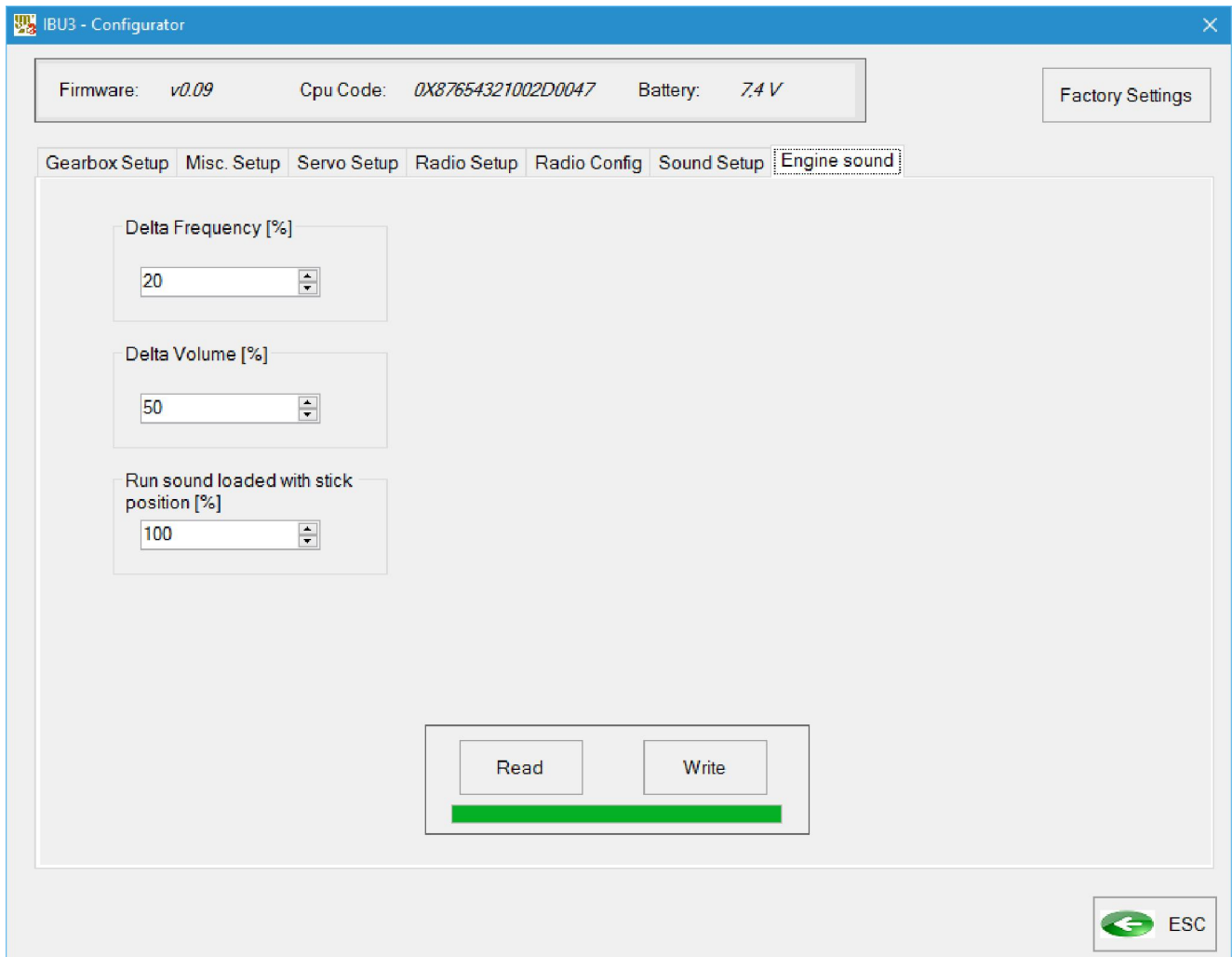
There are some new files:

- **Revsing**
with the Tank idling push the throttle stick from neutral rapidly to 100% of reverse gear, the acceleration sound is played in neutral.
- **Braking**
During the movement (if the braking simulation is enabled) bringing the throttle stick in the opposite direction to the direction of travel is played the sound of braking
- **Release**
During the movement by releasing the stick to neutral the sound of the throttle release is played

The engine sound may vary in frequency and volume in relationship to the movement.

The IBU3 module independently manages the change in frequency and sound volume according to the throttle position. These parameters can still be configured as described in the next paragraph

ENGINE SOUND SETUP



(Delta) Frequency shift - With this control you can set the maximum change in engine sound frequency depending to stick position.

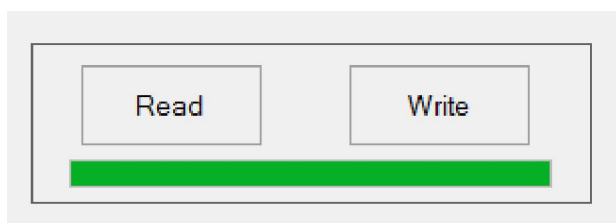
The sound of a real engine varies in frequency in relationship with RPM, the particular IBU3 audio management allows to simulate the variation of the frequency with throttle stick position

(Delta) Volume variation - With this control you can set the maximum variation of the engine sound volume depending to stick position.

As previously discussed the sound of a real engine increase with RPM also varies noise, the particular audio management of IBU3 allows to simulate the volume variation depending to stick position

engine sound insertion point - You can set the point of insertion of the audio sample with respect to the stick position

Example: in the case of the motor moving the sample equivalent to 50% of the maximum speed, the correct point of insertion would be 50%, then to 50% of stick travel (forward or reverse) will be reproduced without the sample modulation, for higher positions of the stick the sound will be modulated by increasing the frequency (and volume), while for lower positions will be modulated decreasing the frequency (and volume). This particularity allows to use only one sample and eliminates the feeling of "jump" from one engine step to another



After configuration save the settings by clicking on the command write.



USER MANUAL

FIRMWARE UPDATE

When a new version of firmware is released, it will be available for free download



Connect the IBU3 module to the PC as previously described

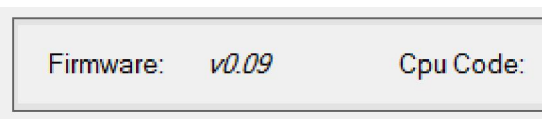
After downloading the new .dfu file from the main page press the button Firmware Update

Make sure the module in update mode IBU3 checking that the green LED blinks slowly

It will automatically open the browse files tab, browse through the folders and select the path where the .dfu file was saved

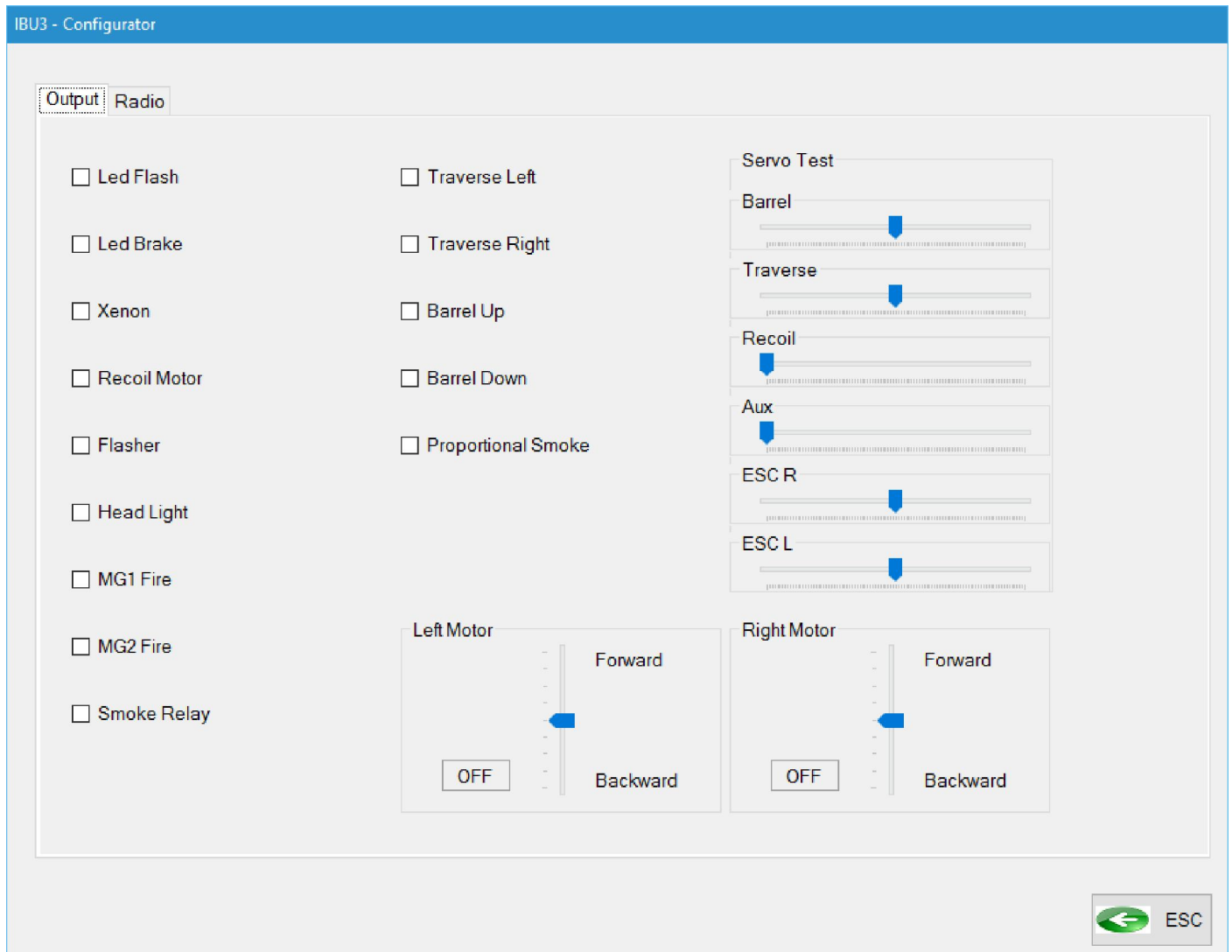
Select the file and click on open

Automatically the new firmware will be installed on IBU3 module, when finished you will be prompted to restart the module (power-cycling the system)



Verify that the new version of firmware is installed by checking the current version shown at the top of the configuration page

IBU3 TEST PAGE



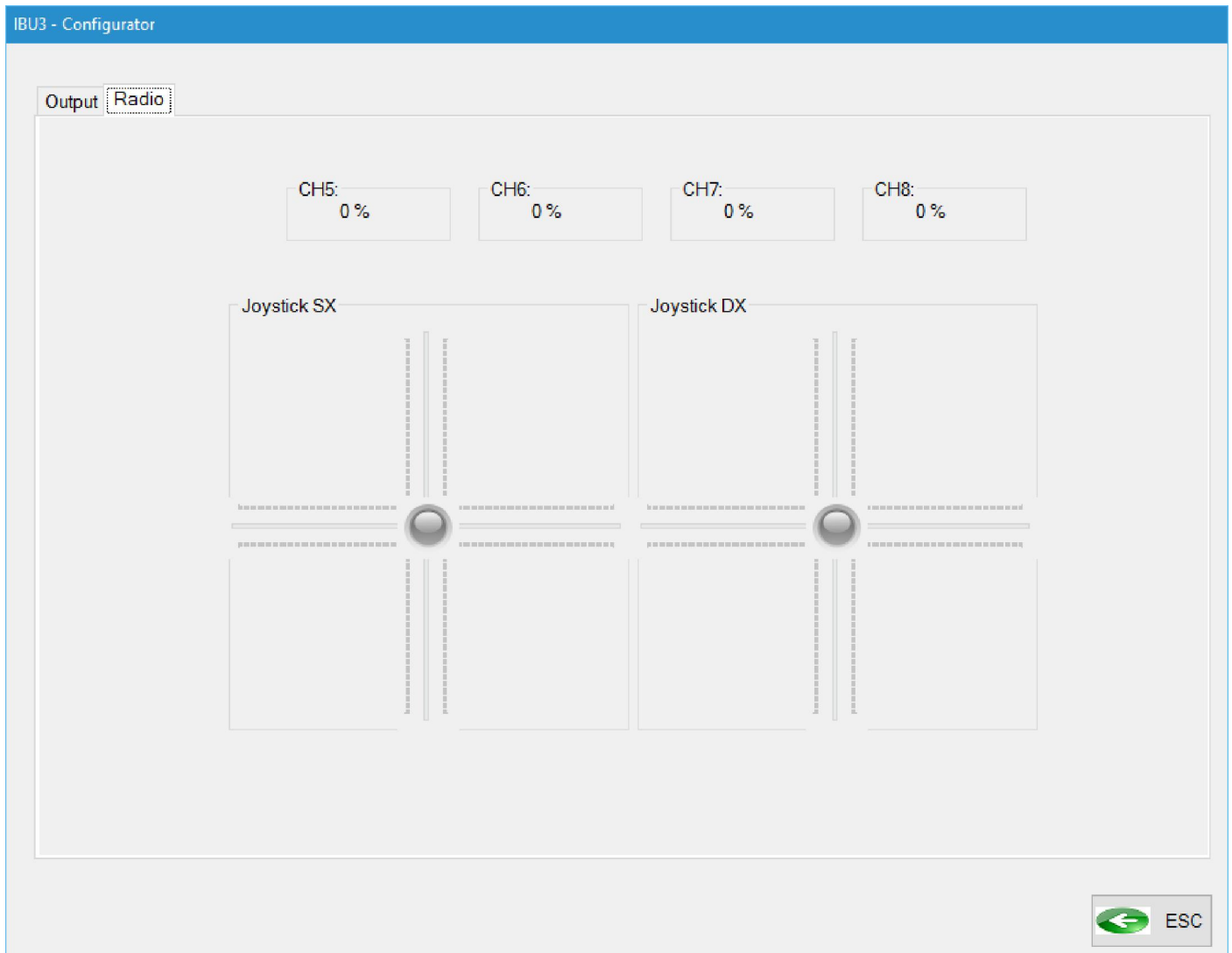
The output test function allows to check the IBU3 module functionality and the devices connected to it without having to use the radio.

Ticking the boxes for the outputs they are activated allowing you to verify proper operation

By moving the cursor relative to the servo you can test the functionality of a servo connected to the output

By moving the cursor relative to the motors you can test the functionality, the correct direction of rotation and correct left / right connection

RADIO CONTROL TEST PROGRAM



The RADIO test function allows you to check the functionality of the transmitter and the correct calibration with IBU3 module

Moving the stick/slider/switch for the available channels you can check whether the calibration was successful