

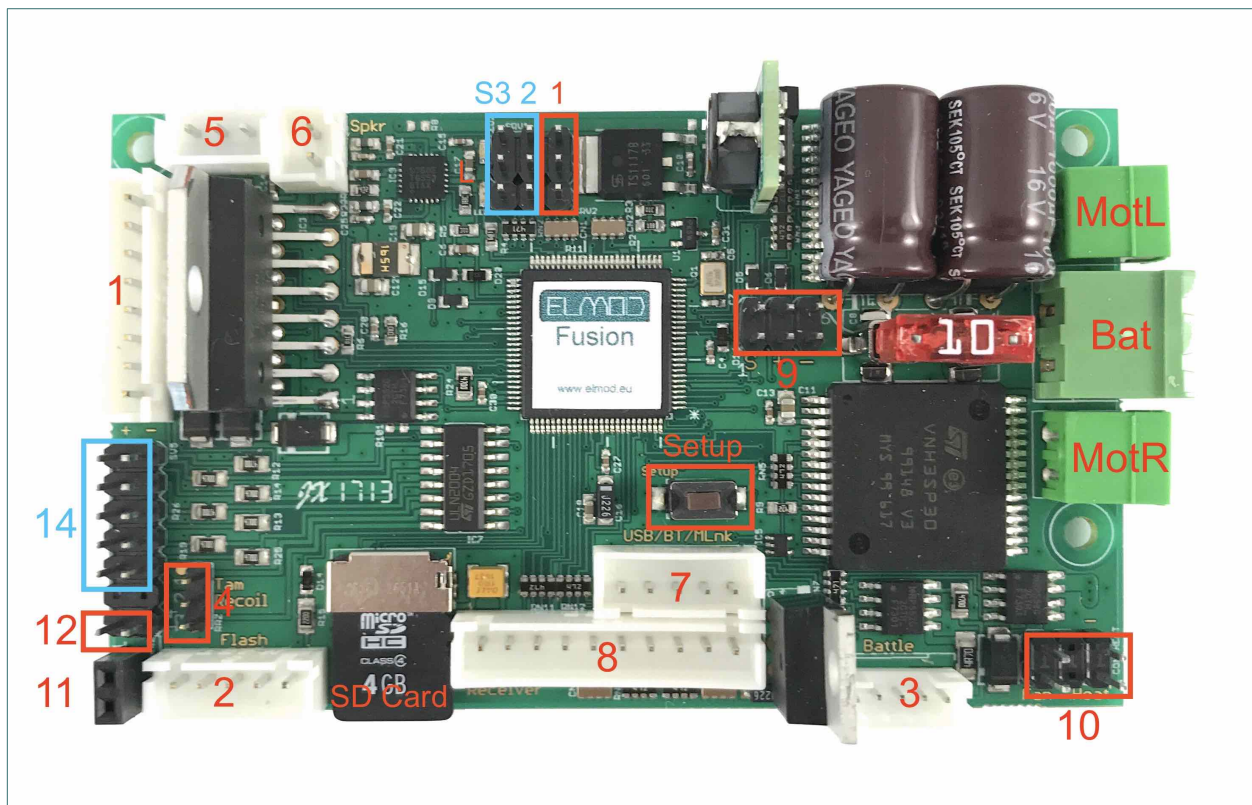
Read these instructions carefully before installation.

Congratulations on your purchase of the *EIMod Fusion*, the innovative and universal full-option-solution for different types of vehicles. The *EIMod Fusion* enhances your model by true to scale movement, extensive weapon-, lighting- and other functions combined with simple installation. All functions right down to the last detail may be easily adjusted on your Windows® or Apple® Computer or an Android® Smartphone or Tablet by over 100 parameters which are logically grouped and explained in detail.

### Scope of delivery

- *EIMod Fusion* PCB
- Volume control rotary knob with cable
- Cable for the RC receiver
- Plug with for connecting to the battery
- Plug for connecting up to two drive motors
- Cable for connecting to the loudspeaker
- Extension cable for turret components
- MicroSD card (already plugged-in on the PCB)
- USB dongle and an USB cable for connecting to the computer
- *EIMod Fusion PRO* only: Cables for additional light sources

### Connectors and operating elements



#### Fusion ECO and Fusion PRO

Bat	battery connector	5	connector for the volume control rotary knob
MotR	connector for the right motor	6	connector for the loudspeaker
MotL	connector for the left motor	7	connector for the USB dongle and EIMod BT adapter
Sw	pushbutton for the setup, firmware update and reset	8	connector for the RC receiver
S1	servo connectors	9	connectors for external motor drivers
L	status LEDs	10	connector for a smoke unit
SD	microSD card	11	connector for Taigen®, HengLong® recoil/shot mechanics
1	turret connector (HengLong®)	12	connector for Taigen®, HengLong® recoil servo pcb
2	muzzle flash connector (Taigen®, HengLong®)		
3	connector for IR battle functions		
4	connector for the Tamiya® barrel recoil mechanics		
			additively Fusion PRO (marked blue)
		14	connector for additional lights
		S2,S3	servo 2 & 3

Hint: all connectors are marked and described on the top or bottom side of the PCB.

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This section describes the installation step by step. It is of utmost importance that all steps are carried out correctly and completely. Incorrect or improper connection can lead to malfunctions or to damage and/or destruction of the electronics, the installed components or the model! Contact the service department of your dealer if you have any questions about installation which are not answered by this manual.

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## Power supply

The *EI*Mod Fusion PRO can be used with batteries up to 12V. The *EI*Mod Fusion ECO up to 10V.

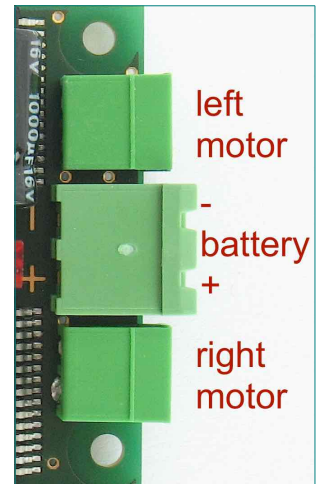
- Connect the battery to the battery plug. Connect the red cable to the "+" connector and the black cable to the "-" connector of the battery plug. ATTENTION: Mixing up the connections leads to destruction of the electronics!
- Keep the cable length as short as possible. This helps to avoid interference!

The *EI*Mod Fusion has a deep discharge protection and an overvoltage protection function. For the correct function, the battery type used must be set in the *EI*Mod App according to the battery type used. For details see section "Battery protection".

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If any other battery type as listed is used, a proper function cannot be guaranteed.  
The warranty is void if higher voltage than allowed is used!

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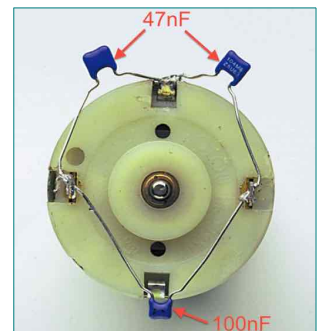


## Drive motors (integrated drivers)

The *EI*Mod Fusion supports one or two DC motors for the main drive. Brushless motors and motors with an extra high current consumption may be used optionally by commercially available external drivers (see next chapter). It is not possible to operate integrated and external drivers simultaneously.

The maximum current consumption of the drive motors is internally limited to 30 A peak. The maximal permanent load is 10 A. The motor drivers need no further cooling. They are protected against short circuit and overload.

- Attach the motor wires for the right drive to the connector *MotR*.
- Attach the motor wires for the left drive to the connector *MotL*.
- For vehicles with only one drive motor use one of the two connections.
- It makes no difference which cable (+/- of the motor) is connected to which screw of the corresponding terminal.
- Keep the cable length as short as possible in order to prevent interferences! For additional interference protection the motor cables can be twisted.
- IMPORTANT! The motors must be interference-suppressed. This is accomplished with the use of three capacitors as shown in the figure. Many motors are interference-suppressed already. Please check this by asking the producer or distributor of your motors.



For checking the correct wiring of the motors proceed as follows:

- Make sure that the driving shaft is free to rotate and the model cannot move uncontrollably.
- Connect a fully charged battery to the electronics and connect the power supply in accordance with section "connection of the power supply".
- Please wait for 3-4 sec. until the blue LED starts blinking constantly.
- Press and hold the setup pushbutton.
- The motors start rotating after around 3 seconds. The motors are connected correctly if the left one is rotating slightly slower than the right one.
- Every few seconds the motors change their rotation. Release the button when the chains or wheels rotate forward. Now the motors are set up correctly.
- When only one motor is attached proceed accordingly. Release the button when the motor rotates forward.

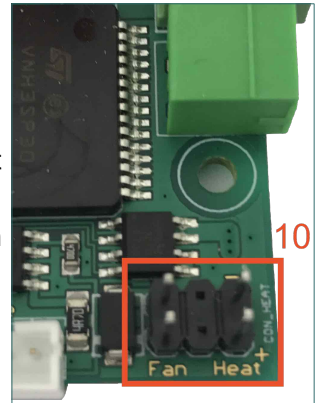
## Drive motors (external drivers)

Commercially available external drivers may be connected directly to the *EIMod Fusion*. The operating type (internal/external drivers) must be set in the *EIMod App* (tab "drive", parameter "motor drivers") to "external"- It is not possible to operate integrated and external drivers simultaneously. The external drivers are connected with the *connectors 9*. The brown ground wire of the drivers points to the right edge of the PCB (towards the battery connector).

## Smoke generator

The smoke generator is connected to the connector for the smoke generator (*connector 10*).

- If the smoker generator provides two wire operation only (combined fan and heater), attach it to the fan labeled connector.
- If the smoker generator provides four wire operation (separated fan and heater wires), attach the fan wires and the heater wires to the respective pins.
- The polarity of the connectors are printed on the board.



## Turret functions

The *EIMod Fusion* provides a HengLong® compatible 8-pin turret terminal (*connector 1*). It is used by the turret rotation motor, gun elevation motor, main gun trigger motor, front lighting and the muzzle flash of the main MG.

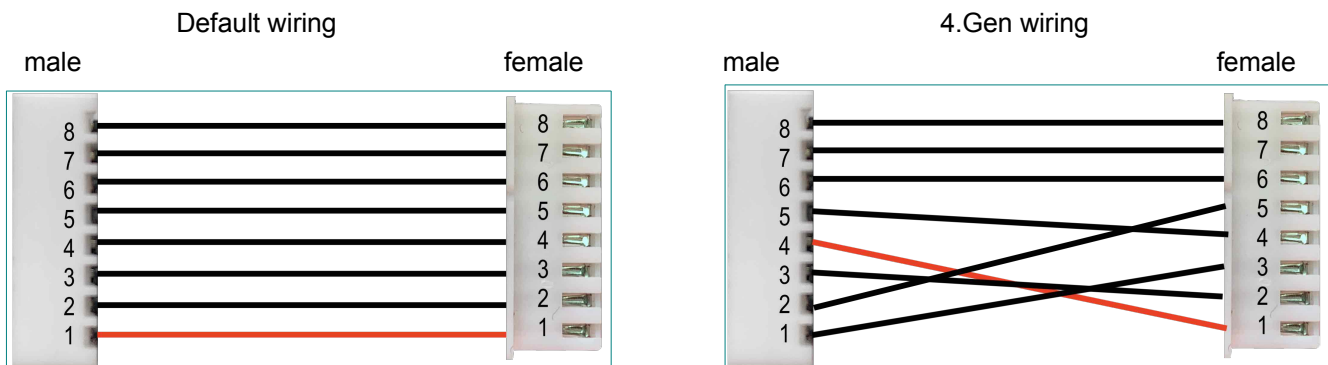
If the turret cable of your model is too short, you can use the included extension.

On some models the cable assignment of the turret connector differs from that on the *EIMod Fusion*. These models are often called "4th generation" in the trade. In this case, the cables in the turret cable must be reordered. Alternatively, you can use the included extension of the turret cable and carefully pull out the pins from the plug (male side) and insert them again according to the illustration.

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Check the assignment of the cable again before powering the electronics! Faulty wiring can lead to destruction of the electronics or defects in your model!

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For Tamiya® models you can obtain an optional adapter for the turret functions. The turret drive, gun elevation drive, the main light and the muzzle flash of the main MG can be attached directly into the *EIMod Fusion*.

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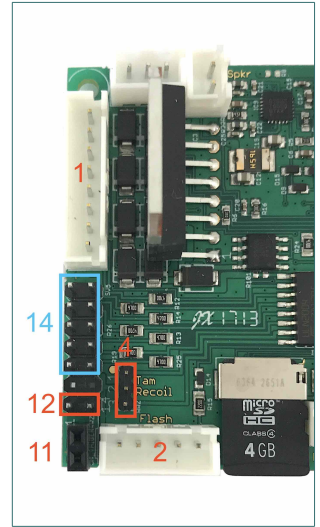
All turret components are always supplied with full battery voltage. If motors with a lower voltage are to be used, the voltage must be reduced by adjusting the maximum speed in the *EIMod App*. For example, if a 7.2 V motor is used together with a 12 V battery, the setting for the maximum speed of this motor must not exceed 60% (60% of 12 V = 7.2 V). Higher values can cause damage to the motor. Also note that higher voltage leads to higher current consumption of the motors! The maximum current for the turret motors is 2 A per motor. Higher currents can damage the electronics.

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## Shot function

Basically all HengLong®/Taigen® shot systems are operable as soon as the 8-wire turret cable is attached to *connector 1*. In this case the shot function is active as long as the trigger is actuated. Depending on the assignment of the plugs and the settings in the *EIMod App*, this basic function can be extended. The corresponding parameter "Recoil Type" in the *EIMod App* can be found in the "Weapons" tab.

- Setting "Standard" corresponds to the basic setting (turret cable only). If the ground cable of the shot system is also connected to the negative pole of the battery, the firing mechanism automatically returns to its initial position after the trigger is released.
- Setting "Airsoft" is suitable for the firing mechanism for plastic balls. The shot sound is played at the same time as the ball is fired. For this purpose, one more cable must be connected in addition to the 8-wire turret cable and the ground wire: the white-orange cable from the switch for the position of the shooting mechanism has to be attached to *connector 12*. The orange wire points to the edge of the board (mark "O" at the bottom of the board).
- Setting "Airsoft with recoil" is suitable for tanks with a firing mechanism for plastic balls AND simultaneous recoil mechanics via a turret built-in control electronics with a servo. The wiring is the same as for the airsoft shot function. Additionally electronics for the recoil mechanics has to be attached to *connector 11*. Plus and minus are marked on the board and correspond to the red or black wire of the cable.
- Setting "Tamiya Recoil" is intended for the Tamiya® recoil mechanics. For this the connector of the mechanics has to be attached to *connector 4*. The white cable faces the marking (golden dot) on the upper side of the board.



**If your cabling differs from the one described here or if you are unsure, please contact your dealer's support! Errors in the wiring can damage or destroy the electronics of the tank or the EIMod circuit board!**

A further possibility to simulate the barrel recoil is the use of a dedicated servo with the appropriate mechanics. Details are described in this section *Servos*. The servo recoil is independent of the setting "Recoil Type" in the *EIMod App*.

## Muzzle flash

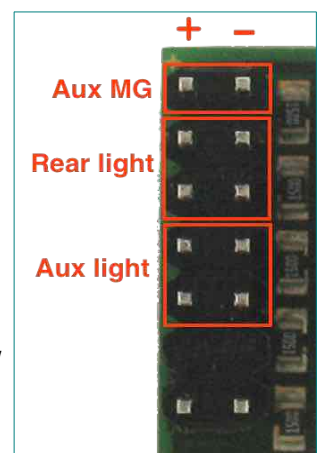
The HengLong®/Taigen® Xenon flash or the HengLong® muzzle flash LED are equipped with a 5-pin plug and has to be connected to *connector 2*. The Tamiya® Xenon flash is not supported. If an LED is used, the flash may be weak depending on the type of LED. The optional *EIMod LED Flash Booster* provides a bright LED flash in this case.

## Light functions

The *EIMod Fusion* is able to control several light channels:

- Front light (white LEDs) and MG muzzle flash (ultra bright white LED) on the HengLong® turret connector (see chapter *turret and weapon functions*).
- Xenon or LED muzzle flash of the main gun and muzzle flash of the MG (see chapter *turret and weapon functions*).
- *EIMod Fusion Pro* provides further light sources:
  - One ultra bright white LED for muzzle flash of the auxiliary MG.
  - One or two red LEDs for combined rear and brake lights. The rear light is controlled together with the front light. The brake light is active independently of the state of the main/rear light.
  - One or two white LEDs for auxiliary light (e.g. camo light).

All light outputs are short circuit protected and current limited.



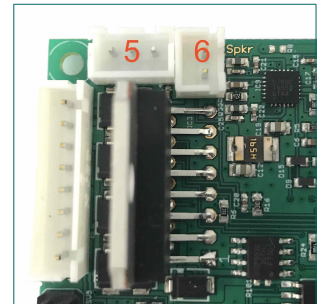


## Pin assignment

Turret (connector 1) from top		Muzzle flash (connector 2) from left		Battle (connector 3) from left	
o	motor turret rotation	o	not used	o	signaling LEDs cathode
o	motor turret rotation	o	not used	o	sensor signal
o	motor elevation	o	power supply – (LED and xenon flash)	o	ground
o	motor shot	o	signal + (LED and xenon flash)	o	IR sender cathode
o	common motor elevation and shot	o	power supply + (xenon flash only!)	o	+5V power supply
o	Light common +				
o	main light -				
o	muzzle flash MG -				

## Loudspeaker and volume control

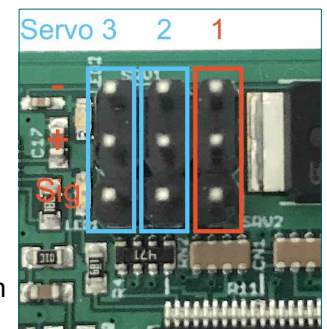
- Plug the provided volume rotary knob to *connector 5*.
- The *EIMod Fusion PRO* also provides the option to control the main volume by the radio. To activate this feature the appropriate parameter has to be set in the *EIMod App* to "external" (tab "sound volume", parameter "main volume control"). In this case the volume control knob on *connector 5* will be deactivated.
- Connect the loudspeaker's cable with the output of a suitable 8 Ohm loudspeaker (*connector 6*). The polarity of the loudspeaker (+/-) is not important.
- For the best possible sound experience install the loudspeaker in an insulated airtight chassis with as large volume as possible.
- Check the correct fitting of the micro SD card. If the card is not well fitted or its contents is faulty, the sounds cannot be played.
- Connect a fully charged battery to the *EIMod Fusion* and wait 3-4 sec. until the blue LED starts blinking constantly.
- Now tap the setup button. The call "battle mode..." is played. Tap the button again until you hear "battle mode off".
- If you cannot hear the call, please check if the volume is set too low.



## Servos

Depending on the type of your *EIMod Fusion* one servo (*EIMod Fusion ECO*) or three servos (*EIMod Fusion PRO*) may be driven. The servos are power supplied by the board. The maximum current is 0,8 A (*EIMod Fusion ECO*) or 1,5 A (*EIMod Fusion PRO*). The servos are connected so that the ground connection points to the upper edge of the board (see image).

Each servo can be assigned one of the functions listed below. The same function can also be assigned to several servos, which is then set individually for each servo separately (e.g. to control three steering axles of a truck with different wheel angle). For each function the direction of the servo deflection can be reversed (servo reverse) and a limitation of the left and right deflection distance can be set separately (useful if, for example, the connected mechanics have a smaller range of motion than the servo arm would allow). By two additional parameters each function can be further adjusted (see table).



The hatch and radar function are auxiliary functions that are activated by additional commands of the RC radio (see chapter *Function control*). E.g. the commander's hatch may be attached to servo 1, AA radar to servo 2 and the driver's hatch to servo 3, the functions are triggered as follows:

- Switch on channel 5 must be positioned to auxiliary functions.
- Left lever to the left for activation/deactivation of the first servo's function (commander's hatch).
- Left lever to the top for activation/deactivation of the second servo's function (radar).
- Left lever to the right for activation/deactivation of the third servo's function (driver's hatch).

function	module type	effect	param 1 (0-100%)	param 2 (0-100%)
barrel recoil	ECO/PRO	barrel recoil after firing the main gun	retraction speed	extraction speed
steering	ECO/PRO	steering axle	speed dependent steering lock angle (0% - off, 100% - no steering on max. speed)	-
elevation	PRO	vertical movement of the main gun. The larger the stick deflection the faster the movement	max. speed	
elevation, modern	PRO	as above. After each shot the barrel moves to the reload position	max. speed	duration of reloading in 0.1 secs
traversal	PRO	horizontal movement of the main gun. The larger the stick deflection the faster the movement	max. speed	
turret rotation	PRO	turret rotation with an external ESC	-	-
hatch function	PRO	simulation of an open/close function. On: servo moves to the end position. Off: servo moves to the origin position	opening speed	closing speed
radar/wiper function	PRO	wipe function. On: servo moves between both end positions, Off: servo moves back and remains in the starting position	speed of the "to" movement	speed of the "fro" movement

### IR battle functions

The *EI Mod Fusion* module offers a combat function compatible to Tamiya® Battle Unit®. The configuration is done by a short tap on the setup button. The new setting is immediately active.

Each time the Setup button is pressed, an announcement is audible about the currently selected setting. These are:

- Battle Mode light Tank for a light tank.
- Battle Mode middle Tank for a middle tank.
- Battle Mode heavy Tank for a heavy tank.
- Battle Mode test Setting for the test mode. Each infrared signal is now evaluated. In this setting, a hit can be triggered with almost any infrared remote control or by switching on a fluorescent lamp, thus testing the function of the receivers.
- Battle Mode off for deactivating the fight function.

The selection of the vehicle type affects different characteristics during the battle. These properties are summarized in the following table.

setting	Hit count			Time in seconds			Mushroom blinks after power up
	slight slow down*	strong slow down*	destruction	reload time	invulnerability after a hit	delay until resurrection	
test mode	1	3	6	3	2	5	4x
light	1	2	3	3	15	15	1x
middle	1	4	6	5	12	15	2x
heavy	1	5	9	9	10	15	3x

\* means the reduction of the maximum speed at which the vehicle can move.

The *EIMod Fusion* module signals certain events with the following sounds:

- A fanfare after each "resurrection". After the fanfare the vehicle cannot be shot down for the time indicated in the table ("invulnerability after hit").
- Reloading procedure is finished. Until this sound is heard, no further shot can be fired.
- A metallic impact after a hit is received. The vehicle stops and cannot be moved for two seconds.
- An explosion if the vehicle is destroyed. The vehicle is then not controllable for the duration specified in the table.

Additional electronics are required for the IR combat function:

- An IR sensor to detect a hit with LED display (sensor mushroom)
- An IR transmitter, preferably placed in the barrel of the gun

These components are supported in the following version:

- Fusion IR Battle Set connects directly to port 9.
- Tamiya® Sensor Mushroom and Transmitter is connected to port 9 via an additionally available adapter.
- HengLong®/Taigen® sensor mushroom and transmitter is connected to port 9 via an additionally available adapter.

### Vehicle control using computer or Android®

The *EIMod Fusion* can be controlled via a Windows® or Apple® computer or Android® smartphone/tablet. For this purpose the optionally available *EIMod Bluetooth* is required, which has to be attached to *connector 7*.

The computer control remains deactivated as long as connector 8 (receiver) is left empty. Parallel operation with a proportional receiver is not possible.

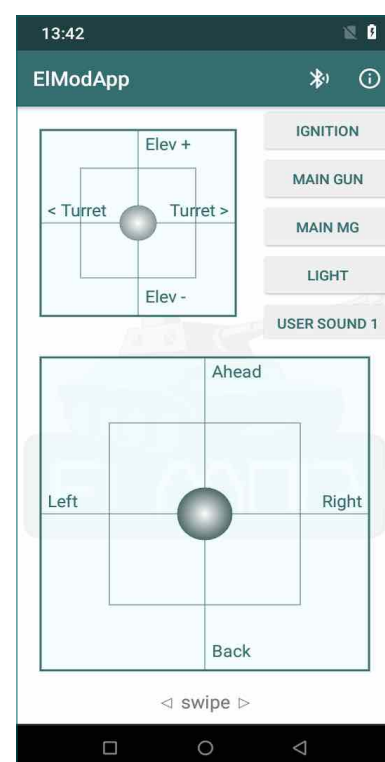
### Vehicle control using a RC receiver

The *EIMod Fusion* is operated on a standard RC system. The number of channels depends on the requirements and is summarized in the table. The power supply of the receiver is provided by the *EIMod Fusion* (5V BEC, servo connector with the red/black wire), so no receiver battery is necessary.

The number of connected channels is determined automatically. For correct detection and optimum operation all mixers must be deactivated, servo deflection must be 100% and trim must be centered. Contact the service department of your dealer if you have problems with the detection and operation of your radio system with the *EIMod Fusion*. The cause can usually be easily determined and corrected using the *EIMod App*.

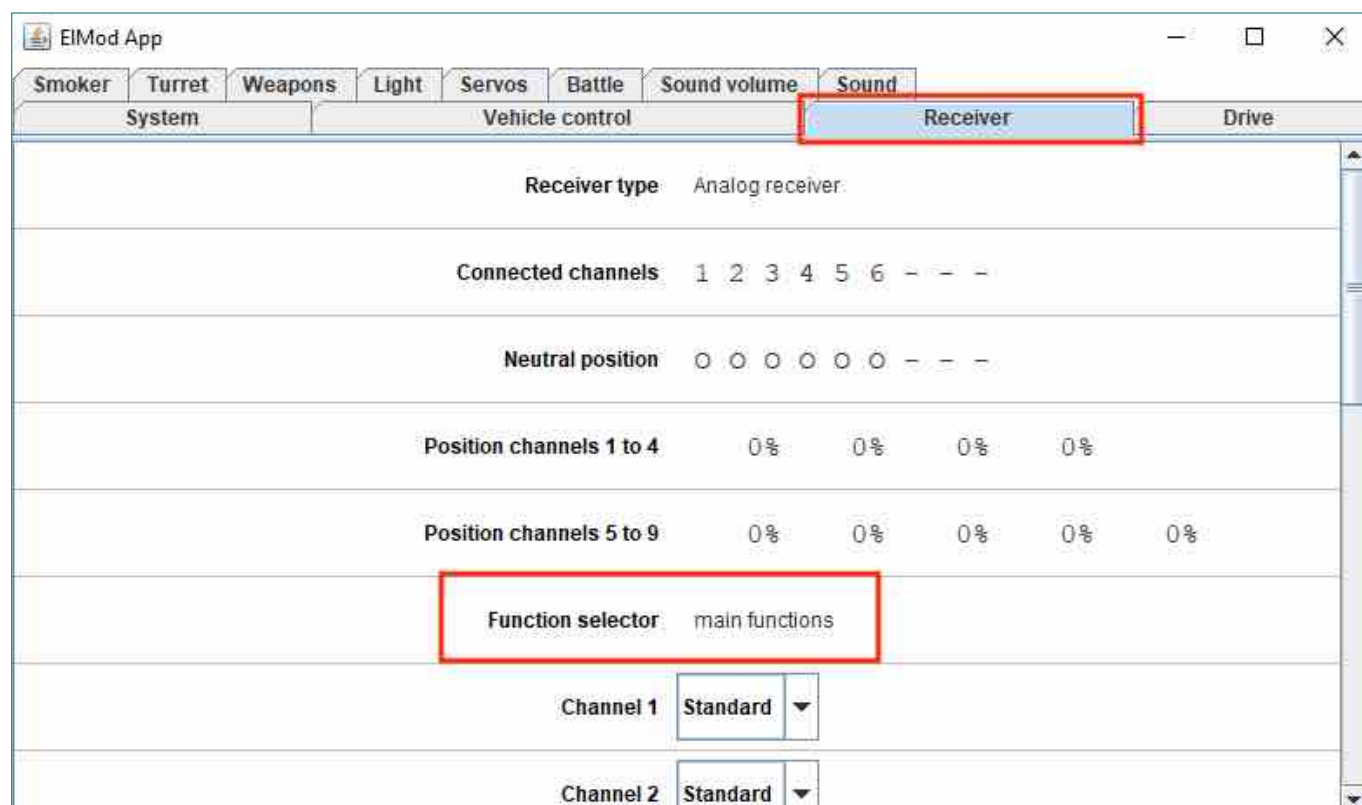
To support the full range of functions, channel 5 must be equipped as a switch with three positions (top - middle - bottom) or as a knob/slider. The position of the switch determines which command level is active on the left stick (main functions, extended functions or user-defined sounds). If no 5th channel is available, only the standard functions are available. If the control element is designed as an on-off switch, only two of the three command levels can be selected. Which ones are selected depends on the wiring or configuration of the radio system. The *EIMod App* provides information on this (parameter "Function selector" in the "Receiver" tab shows the current command level. See illustration below).

For the black/red power supply cable, the black cable must be connected to the receiver's ground pin (usually the lowest or outermost pin on the receiver's power supply connector). If the connections on your receiver are not protected against reverse polarity, consult the receiver's instructions for the actual pin assignment. Incorrectly inserted plugs will not damage



the components, but will simply prevent the receiver from functioning.

module type	channel	function	wire color	control
ECO/PRO	1	acceleration and ignition	brown	stick
ECO/PRO	2	steering	orange	
ECO/PRO	3	turret, weapons, light and auxiliary functions	yellow	stick
ECO/PRO	4		green	
ECO/PRO	5	selection of the function group	blue	3-way switch (up/off/down) or slider/knob (reduced function when using an on/off switch)
ECO/PRO	6	user functions 1 & 2	violet	3-way switch (up/off/down) (reduced function when using an on/off switch)
PRO	7	user functions 3 & 4	grey	3-way switch (up/off/down) (reduced function when using an on/off switch)
PRO	8	volume control	white	slider/knob



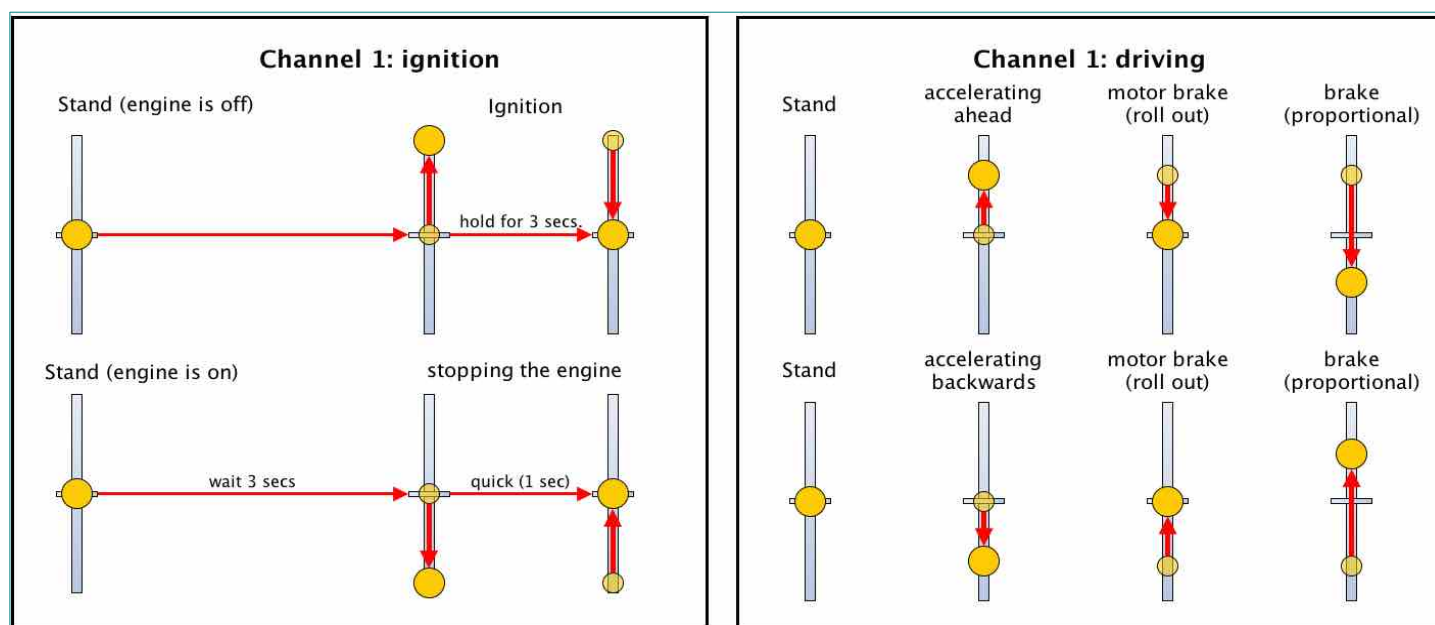
Depending on the system, it may be necessary to adjust the channel sequence or reverse the servo deflection. Please read the manual of your radio remote control. The signal from channels which are not assigned in the transmitter system varies from manufacturer to manufacturer. For this reason it is important that lines from unused channels are NOT connected..

### Motor control (channels 1 & 2)

The ignition and acceleration/brake control is made by channel 1 (brown wire). After power up the engine doesn't run and the vehicle cannot be moved. To start the engine the throttle control must be moved to the upper most position and hold until the ignition sequence starts (see image below). Wait until the ignition sequence is finished and the idle sound is played. Now the vehicle is operational.



- For moving the vehicle forward, the throttle control must be moved to the top. After engaging a gear the vehicle starts moving.
- Is the throttle control released or moved back to the center, the vehicle rolls out (engine brake).
- Is the throttle control moved in the opposite to current direction, the vehicle brakes (actively braking).
- The brakes are full proportional. That means, the higher the deflection in the opposite direction the stronger the brake force.
- If the vehicle comes to a stop and the throttle control is not put back to the center, the vehicle will stand still for a moment and start moving in the opposite direction.
- The vehicle direction is controlled by the horizontal deflection of the right throttle stick (depending on the configuration by chains and/or steering axes).
- All drive related parameters, such as maximum speed ahead and back, acceleration and deceleration power, hold time during directional change and many more may be configured in the [EIMod App](#).



To switch off the motor, proceed as follows: stop the vehicle for at least three seconds. Then move the stick to the bottom most position and release it back quickly. This procedure may not last longer than one second.

Is the motor restarted after just a short time, a shorter start up sequence (warm start) is played. The time of cooling down the engine may also be configured in the [EIMod App](#).

### Function control (channels 3 to 7)

The control of the functions of the turret, weapons and the lights is done by the left stick and the switch or slider/knob on channel 5. Depending on the position of the switch on channel 5, the right stick controls

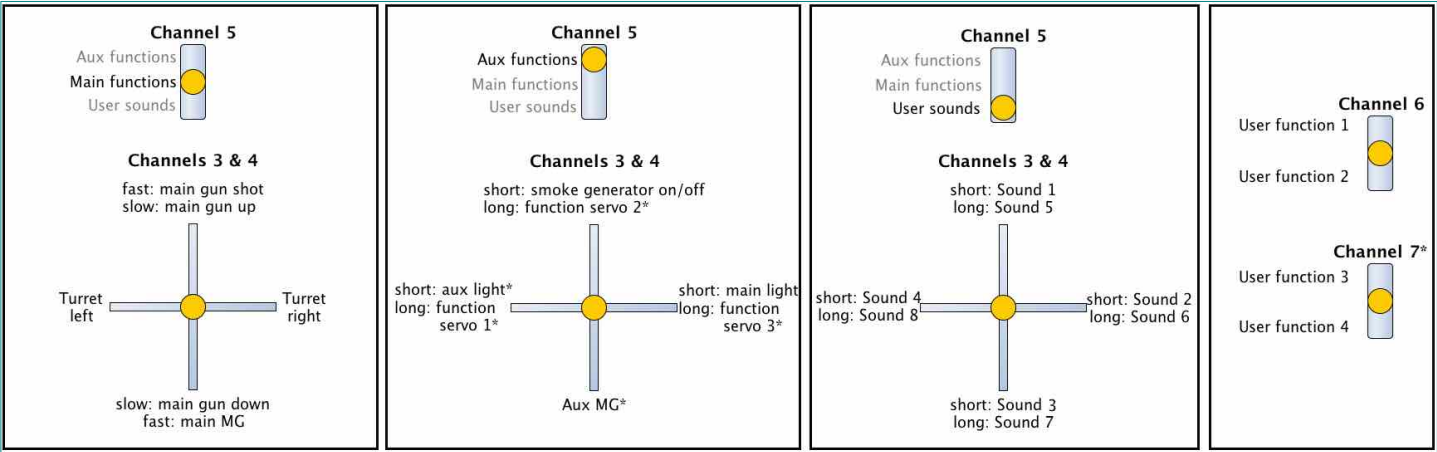
- main functions (turret rotation, elevation of the main gun, fire the main gun and light control),
- auxiliary functions (light control, activation/deactivation of the optional smoke generator, ambient sounds, servo functions)
- or the playing of user sounds (e.g. horn).

Depending on the sample set there are different numbers and contents of user sounds. If a particular user sound is not defined, the sound "User 1" to "User 8" is played. Custom user sounds may be easily added with the [Sound Manager](#).

Channel 6 ([EIMod Fusion ECO](#)) or channels 6 & 7 ([EIMod Fusion PRO](#)) may be assigned freely to different functions with

the *EIMod App*. This allows quick access to frequently used functions such as light control or smoker operation.

The function layout is shown below. Short operation means holding for about 1 sec. Long operation means holding for 2 sec or longer.



\* *EIMod Fusion PRO* only.

Extended function control (channels 3 to 7)

- If channels 5 or 6 and 7 are assigned to knob/slide controls, the number of available user sounds or user functions increases:
- Channel 5: there are two additional function groups for the position half down (usersounds level 2) and half up (usersounds level 3). This makes a total of 24 user sounds possible.
  - Channel 6 and 7: with the positions half up and half down the number of user functions doubles to four (*EIMod Fusion ECO*) and eight (*EIMod Fusion PRO*) respectively.

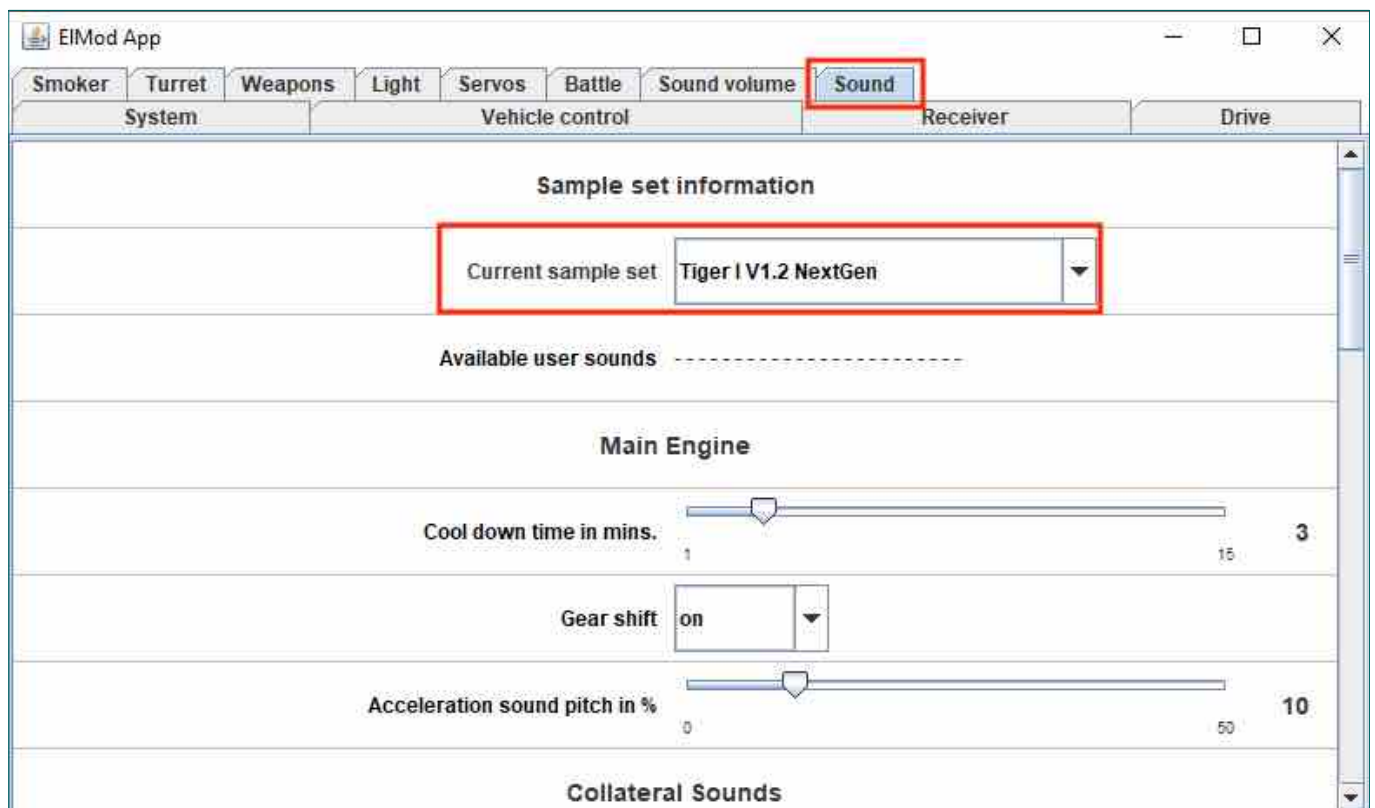
Status LEDs

The blue and red status LEDs on the PCB show the current operating status of the *EIMod Fusion*.

off			on	ready to operate. blue LED blinks once after stick movement
off			blinking	no receiver signal identified
on			off	under or over voltage protection active
on			on	no SD card inserted, card empty or its contents faulty (operation with default settings and without sound)

Sound

The microSD card supplied with the *EIMod Fusion* contains ready-to-use sample sets for various model types (tanks, half-tracks, trucks, etc.). The sample set of a german Panzer VI Tiger is activated at delivery. To activate a different sound set, start the *EIMod App* and select a new sound set from the drop-down box in the "Sound" tab. The new sound set is immediately active.



Alternatively, you can connect the SD card to a computer and use the [Sound Manager](#) program to make the selection. This program is located directly on the SD card and requires no installation.

To remove the SD card, pull it out carefully of the slot in the direction shown.



**Never drag the card in a direction other than the one shown! This can lead to permanent mechanical damage to the card holder and thus to destruction of the electronics!**

## Installation

When selecting the installation location, the following must be observed:

- Make sure that short circuits are excluded. No live parts may touch each other. It is best to insulate all open cable connections with a piece of heat shrinkable tubing.
- Keep current-carrying cables, especially the supply lines to the drive motors and drive battery as short as possible to minimize interference.
- Ensure that the receiver's antenna is not located within shielded metal walls (e.g. in the hull of a vehicle) or between power consumers (motors). This can lead to drastic deterioration of the radio signal, loss of radio communication and loss of control over the model. The *EIMod Fusion* is equipped with fail-safe mechanisms that help to detect radio signal failure. Depending on the manufacturer and settings, receivers can react unpredictably to an interruption of the radio link and, for example, continue to output the last correctly received signal.

## First start up

- Make sure that all cables have been laid correctly.
- Switch on the radio transmitter.

- Insert a fully charged battery and switch the vehicle on.
- The blue status LED lights up shortly after switching on and goes out again.
- After 2-3 seconds it starts flashing regularly (search for receiver signal).
- The blue LED stays on as soon as the receiver signal is identified and the number of active channels has been defined or a command has been given via the vehicle control in the *EIMod App*.
- Start the engine and drive off! Have fun with your model!

## Battery protection

The *EIMod Fusion* is equipped with a voltage monitor which protects the battery from deep discharge. The setting of the battery type can be changed in the *EIMod App*. The standard setting is 6-cell NiMH battery. With this setting any other battery type up to 12V (10V for *EIMod Fusion ECO*) can be used, but in this no protection is given.

In order for the battery protection to become active, the switch-off voltage must be undercut for at least one second. All driving functions and sound are then immediately disabled. The red LED remains permanently on, the blue status LED is off. Every five seconds the announcement "Low voltage" is played. To switch off the active battery protection again, the battery has to be replaced or recharged and electronics must be switched off and on again.

## Installation of the EIMod App

With the help of the free *EIMod App* it is possible to customize the electronics to your needs. The software is freely available for Microsoft® Windows® operating systems, MacOS® and Android®. It allows a wide range of parameters to be set and information about the operating status to be read out. Furthermore firmware updates can be transferred to the *EIMod Fusion* module (not yet supported by Android®). Please note that when installing the software it may be necessary to ensure that any anti-virus software or other security settings do not prevent access to the USB hardware or block the execution of the program.

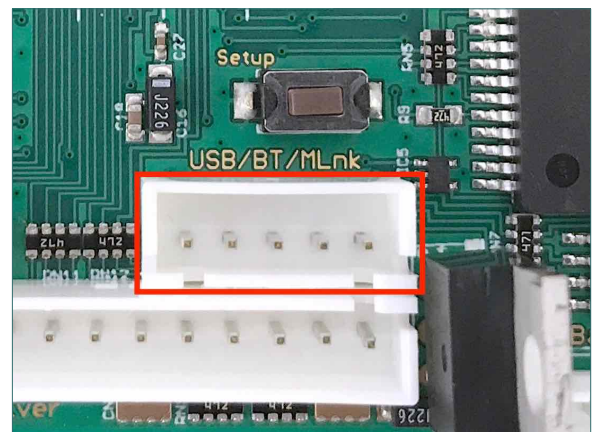
Under Microsoft® Windows® it is necessary to install a driver for the USB dongle. This driver is included in the installation package. Alternatively, the driver can be downloaded directly from the manufacturer. The link can be found on our website.

Under MacOS® the driver is already integrated in the system. If you did not download the *EIMod App* for MacOS® in the Apple® App Store®, it may be necessary to explicitly allow the execution of the *EIMod App*.

To do this, start "Security & Privacy" in the System Preferences, then click on "Allow apps downloaded from: App Store and identified developers". After the first execution of the *EIMod App*, return to the "Security & Privacy" settings and click on "allow" right to the listed *EIMod App*. This only needs to be done once.

To attach the board to your computer, plug the USB Dongle to the *connector 7* and use the included USB cable to link the dongle to the computer.

A wireless connection to the *EIMod App* is possible with the optionally available *EIMod Bluetooth Adapter*.



## Parameter configuration

The factory settings of the *EIMod Fusion* matches a german Panzer VI Tiger.

To change settings with the *EIMod App* a connection to the *EIMod Fusion* must be established. Proceed as follows:

- Power on the *EIMod Fusion* and connect it to the computer.
- Start the *EIMod App*.
- After 2-10 sec. the *EIMod Fusion* will be detected and the current settings are shown on the screen.

With the *EIMod App* various settings can be made and different informations are displayed. The main screen is divided in four areas:

- On the upper edge there is a tab to choose the parameter's group.
- In the center area the parameters of the current category are listed. Each parameter has a detailed description. It is shown whenever you hoover the mouse pointer over the parameter's name.
- Below are several buttons:
  - "Load profile" loads a previously saved or provided setting profile from your hard disk.
  - "Save profile" saves all current settings on your hard disk.
  - "Help" shows a brief manual for the *EIMod App*.
  - "About" shows the version number of the software and legal notes.
  - "Quit" closes the *EIMod App*.

## Optimization of the driving characteristics

Very rarely will a profile fit a model perfectly. Different battery voltages, motor types, gear type and transmission ratio, chain material and weight are just a few examples of characteristics that can have a drastic effect on the handling. To create a new profile that fits your model, proceed as follows:

- Switch on the radio control, start your model and connect it to your computer and start the *EIMod app*.
- Load a profile that best matches your model. This profile is the basis for the following adjustments.
- Set the correct battery type (tab *System*. Parameters *Battery type*). Check if the current battery voltage shows a full charged battery (tab *System*, parameter *Battery Level* ). If this is not the case, charge the battery first!
- Start the engine. Set the parameter *Vmin* (tab for this and all further parameters is *Drive*) so that the starting sound and the motion of the vehicle occur in the same moment. Depending on the motor type and the chassis the value is between 1 and 20.
  - If the model starts driving while the idle sound is still heard, raise the value.
  - If the model doesn't move although the driving sound can be already heard, reduce the value.
- Set the parameters *Vmax Ahead* and *Vmax Back* to the desired value. The formula for converting the speed to the original is:  $\text{Speed of the model (in m/s)} = \text{speed of the original (in km/h)} : (\text{scale} \times 3.6)$ . Example: the maximum speed of the original vehicle is 60 km/h. The scale of the model is 1:16. The model should now drive  $60 : (16 \times 3.6) = 1.05$  m/s.
- Set the shift points for the second and third gear so that they are evenly distributed (parameter: *2nd gear speed* and *3rd gear speed*).
- If necessary adjust the acceleration values until you are satisfied with the result (value for *Acceleration 3rd gear* higher as *Acceleration 2nd gear*, higher as *Acceleration 1st gear*).
- Adjust the speed of the spin turn (parameter *spin turn speed*) so that the vehicle is easy to control. If the original vehicle was not able to perform a spin turn, set the value to zero to disable this feature.
- Now drive a few curves at top speed.
  - If the radius of the curve is too large (vehicle does not steer strongly enough), increase the values for the parameters *Outer chain turn power* and *Inner chain turn power* equally.



- There should be no jerk or change in speed when driving out of the curve.
  - If the vehicle becomes faster when coming out of the curve, increase the value of the parameter *Outer chain turn power*.
  - If the carapace slows down when coming out of the curve, decrease the value of the parameter *Outer chain turn power*.
- If your vehicle does not have chain steering, set the parameters *Outer chain turn power* and *Inner chain turn power* to zero and activate axle steering (tab *Servos*, parameter *mode*).
- Adjust the turret's start-up speed so that the sound of the turret rotation corresponds to the turret movement (tab *Turret*, parameter *Turret min. speed*).
- Set the maximum turret rotation speed so that it corresponds to the original vehicle (parameter *Turret max. speed*).
  - Proceed accordingly with the settings for lifting/lowering the gun (tab *Turret*, parameter *Gun elevation min speed* and *Gun elevation max speed*).
- The most important settings are now made. You can now save the new profile on your hard disk by clicking the *Save profile* button.

### Reset to factory defaults

To reset all settings to factory values proceed as follows:

- Switch off the voltage and wait for 5 sec. Preventively disconnect the motors from the electronics or jack up the vehicle so that it cannot move.
- Switch on the voltage again.
- As soon as the blue LED lights up (about 0.5 sec. after power on) press and hold immediately the setup pushbutton.
- The blue LED goes off. After about 4 sec the blue LED and the red LED light up together.
- Release the setup button. All parameters are set to delivery condition.

### Firmware update

For updating the firmware the *EIMod Fusion* must be connected to a computer. To set the PCB in update mode, switch off the voltage and press and hold the setup pushbutton on the *EIMod Fusion*. Switch the voltage on again. The blue status LED blinks three times. Now start the *EIMod App* and press the red "Update" button. Follow the instructions on the screen. The newest firmware versions are always included in the current installation package of the *EIMod App*. A new version of the *EIMod App* may be installed anytime. It's not necessary to deinstall the existing version before.

### In-Depth informations

Several documents describing various aspects of the *EIMod Fusion* Modules are available in our knowledge base which may be found on our web site.

## **SAFETY INSTRUCTIONS**

### **General**

- Damage caused by non-observance of these operating instructions will void the warranty! We assume no liability for consequential damages!
- We accept no liability for damage to property or personal injury caused by improper handling or non-compliance with the safety instructions! In such cases all warranty claims are void.
- For safety and approval reasons (CE), unauthorized modification or conversion of the device is not permitted. Only use original spare parts or equivalent spare parts for repairs.
- Make sure that all electrical connections and connections have been made correctly and in accordance with these operating instructions.
- If the ambient climate changes suddenly (e.g. from a cold room to a warm room), moisture can condense on the unit and possibly destroy it. Do not operate the unit until it has been acclimatized for about 2 hours.
- Do not operate the device in the vicinity of easily inflammable objects, liquids or gases, danger of explosion!
- Do not expose the device to high temperatures, strong vibrations, high humidity or chemically aggressive environments.
- Operate the device only in a dry environment (below 80 % humidity, non-condensing) and at normal room temperature.
- Do not operate the unit unattended.
- If you have any questions about the operation, safety or connection of the device that are not explained in the operating instructions, please contact your dealer's support or another specialist.

### **Electrical hazards**

- Supply the device only with low voltage as specified in the technical data. Only use current sources approved for model making, such as NiMH rechargeable batteries. Operation with voltages higher than 12V is not permitted. There is a fire hazard!
- Observe the limit values for currents as specified in the technical data. Exceeding the permissible values leads to overloading and destruction of the device and carries the risk of fire or electric shock.
- Installation and connection must only be carried out when the device is disconnected from the power supply.
- Ensure that all connecting cables have a sufficient cross-section.

### **Heat hazards**

- Electronic components on the product can become very hot during operation.
- During installation, ensure that there is sufficient air circulation around the device to prevent overheating due to heat accumulation.
- During installation, also ensure that there is sufficient distance to heat-sensitive and flammable objects (e.g. wooden and plastic surfaces, cable insulation).
- Touching the device may burn the skin.

### **Other hazards**

Children can cause all the risks described above due to carelessness or a lack of sense of responsibility. To avoid danger to life and limb, children under the age of 14 must not install our products. Small children can swallow or inhale the sometimes very small components with pointed ends. Danger to life! Therefore, do not allow the components to fall into the hands of small children. In schools, educational institutions, hobby and self-help workshops, the assembly, installation and operation of components must be supervised by trained personnel. In industrial facilities, the accident prevention regulations of the Association of Industrial Employers' Liability Insurance Associations for electrical systems and equipment must be observed.

## **DECLARATION OF CONFORMITY**

The product meets the requirements of EC Directive 89/336/EEC on Electromagnetic Compatibility and bears the CE marking for this purpose.

## **MANUFACTURER'S NOTE**

According to DIN VDE 0869, the person who makes an assembly ready for operation by extension or housing installation is regarded as the manufacturer and is obliged to supply all accompanying documents when passing on the product and also to state his name and address.

## WARRANTY CONDITIONS

This product is guaranteed for 2 years. The guarantee covers the free remedy of defects which can be proven to be attributable to material used by us which is not faultless or to manufacturing faults. We guarantee that the components will function in accordance with their characteristic values when unassembled and that the technical data of the circuit will be complied with when installed in accordance with the instructions and with the prescribed commissioning and operating instructions. Further claims are excluded. We assume no liability beyond the legal regulations of German law for damages or consequential damages in connection with this product. We reserve the right to repair, repair, replace or refund the purchase price.

In the following cases the warranty claim expires: In case of damage due to non-observance of the instructions and the connection diagram, in case of modification and repair attempts of the circuit, in case of unauthorized modification of the circuit, in case of improper removal of components not provided for in the construction, free wiring of components such as switches, potentiometers, sockets etc., in the event of destruction of conductor tracks and solder lugs, incorrect assembly or incorrect polarity of the module / components and the resulting consequential damage, damage due to overloading of the module, connection to an incorrect voltage or type of current, damage due to intervention by third parties, persons, incorrect operation or damage due to negligent treatment or misuse, damage due to contact with components before electrostatic discharge of the hands.

**Nicht geeignet für Kinder unter 14 Jahren.**  
**Not suitable for Children under 14 years.**  
**Ne convient pas pour des enfants de moins de 14 ans.**  
**Niet geschikt voor kinderen onder de 14 jaar.**



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