



EIMod FusionX Rev.C

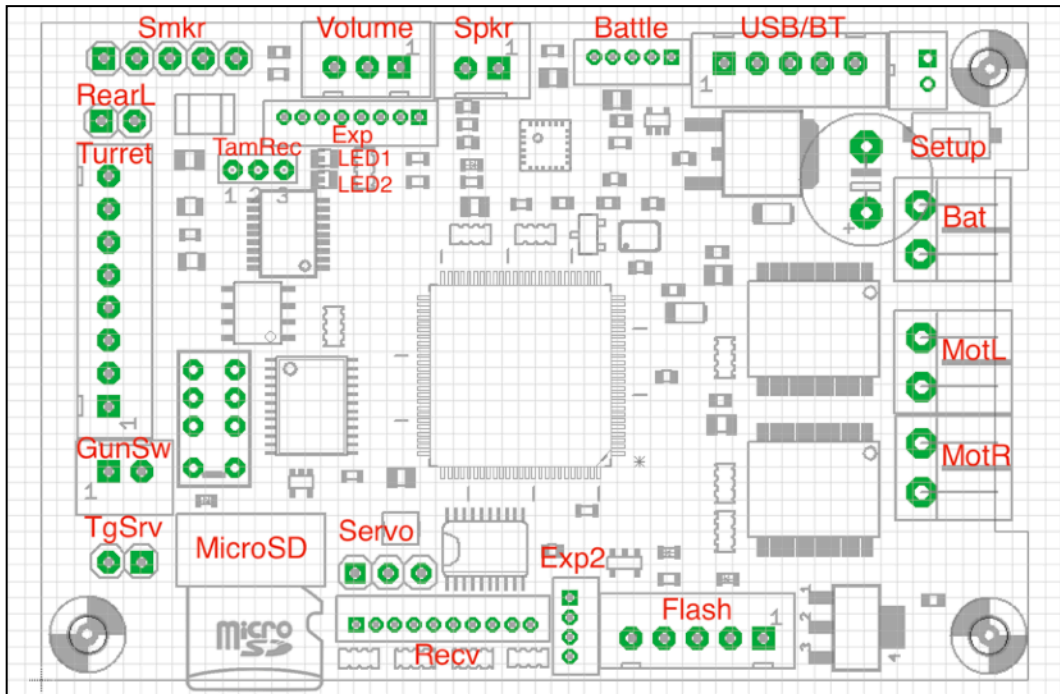
Installation instructions and user manual

Read these instructions carefully before proceeding with the installation! Liability for damage due to improper installation or non-observance of these instructions is expressly excluded.

Scope of delivery

- EIMod FusionX circuit board
- Volume control with cable and connector
- Cable for connection of the radio receiver
- Plugs for connecting one battery and two drive motors
- 15A inline fuse
- a cable for connection of a loudspeaker
- a USB dongle and USB cable for connection to the computer

Connections overview

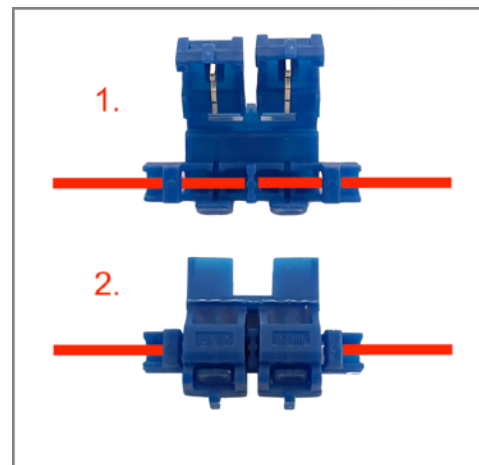


<i>Bat</i>	Battery connection	<i>Turret</i>	Connection turret group
<i>MotL</i>	Left drive motor connection	<i>GunSw</i>	Connection shot end position switch
<i>MotR</i>	Right drive motor connection	<i>TgSrv</i>	Connection Taigen servo based barrel recoil
<i>Setup</i>	Setup button	<i>TamRec</i>	Connection for a Tamiya barrel recoil
<i>USB/BT</i>	Connection USB/Bluetooth dongle	<i>microSD</i>	microSD slot with microSD card
<i>Battle</i>	Connection for FX Battle	<i>Recv</i>	Connection receiver
<i>Spkr</i>	Loudspeaker connection	<i>Exp2</i>	Connection for FX SBus
<i>Volume</i>	Volume control connector	<i>Flash</i>	Connector for muzzle flash
<i>Exp</i>	Connector for FX Expander	<i>Servo</i>	Connector for a servo motor
<i>Smkr</i>	Connector for smoke generator	<i>LED1</i>	Status LED (blue)
<i>RearL</i>	Rear light/brake light connector	<i>LED2</i>	Error LED (red)

This section describes the installation step by step. It is of utmost importance that all work 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 your dealer's customer support if you have any questions about the installation that are not answered by these instructions.

Connection of the power supply

- Connect the battery to the battery connector. Attach the red wire to the "+" terminal and the black wire to the "-" terminal of the battery plug.
ATTENTION! Reversing the connections will destroy the electronics!
- Attach the 15A main fuse to the red cable at a position suitable for your model. To do this, cut the cable, place the ends in the clip connections of the fuse holder and close them until you feel them click into place.
- Attach a connector suitable for your battery type to the battery-facing side of the supply cables. Make sure that no short circuits can occur here during operation of the model. There is a risk of fire!



EIMod FusionX is equipped with a voltage monitor that protects the battery from deep discharge. The battery type setting can be changed in the [EIMod App](#). The default setting is 6-cell NiMH battery. With this setting, any other battery with a voltage up to max. 11.1V can be used. However, deep discharge protection is then not provided for a 3S LiPo battery, for example.

For the battery protection to become active, the switch-off voltage must be undercut for at least one second. After that, all driving functions and sound are switched off. The red error LED remains permanently on, the blue status LED is off. The announcement "Low voltage" is played every five seconds. To turn off the active battery protection again, the electronics must be switched off and on again. If the battery protection becomes active when the motor load is high, e.g. when driving in difficult terrain, the battery used may be of inferior quality or not sufficiently dimensioned for the application. Preferably use high-quality batteries, e.g. Kokam® or Yuki Model®.

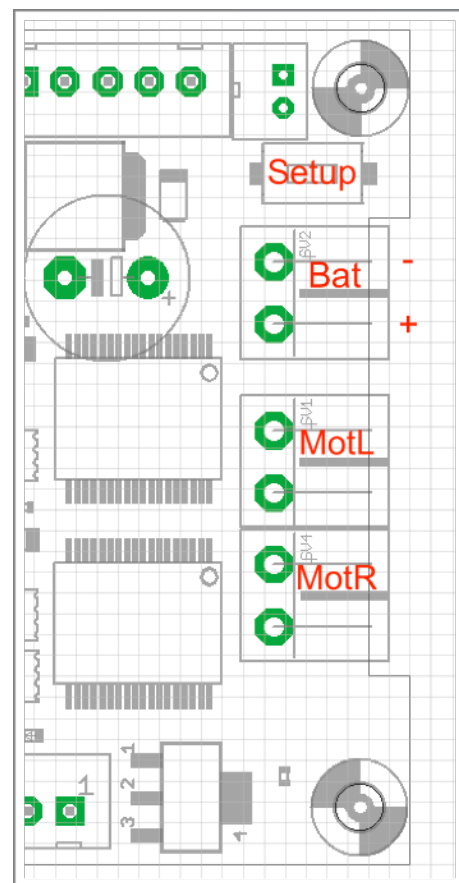
Connection of the drive motors

One or two DC motors can be used as drive motors.

The maximum short-term current consumption of a motor is limited to 30A. The permanent current load is 10 A. The motor drivers are located directly to the left of the motor terminals. They are protected against short circuit and overload. If a driver is overloaded, the motor stops. After cooling down, the drive can be continued. For more frequent failures, the motor drivers can be retrofitted with a heat sink.

- Connect the leads of the motor for the right drive to the MotR terminal.
- Connect the leads of the motor for the left drive to the MotL terminal.
- For vehicles with only one drive motor, use one of the two connections.
- Keep the cable length as short as possible. This helps to avoid interference. As additional protection against interference, the motor cables can be twisted together.

It is irrelevant which cable (+/- of the motor) is attached in which screw terminal of the plug. Reversing the "polarity" of a motor only causes the motor to rotate in the opposite direction. The direction of rotation of the motors is determined by the "teach-in" process described on the next page.



To check the correct connection of the motors and to set the direction of rotation of the motors, proceed as follows:

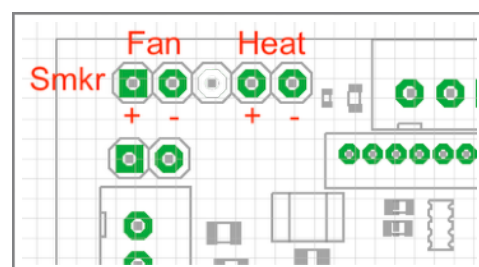
- Make sure that the wheels or chains can rotate freely and that the model cannot drive off uncontrollably.
- Connect the full battery to the electronics and switch on the power supply.
- Wait 5 to 10 seconds until the blue LED starts flashing.
- Press and hold the setup button.
- The motors will start to rotate after about 3 sec.
- Continue to hold the button pressed. The motors will change direction of rotation every few seconds.
- Release the key when both chains or drive wheels rotate forward.
- If only one drive motor is used, release the key when the motor rotates forward.

Now the direction of rotation of the motors is set correctly.

Connection of the smoke generator

The smoke generator may be attached to the "Smkr" connector.

- If your smoking unit has only one connection, attach it to the connector marked "Fan".
- If your smoking unit has a separate connector for the heater and the fan, attach them accordingly to the "Fan" connector for the fan and "Heat" connector for the heater.



The polarity (plus/minus) is printed next to the connections on the PCB. However, it is only important for the fan. When reversed polarity, it will not start or will generate an air flow in the wrong direction.

Please note that the current consumption of the fan or the heater can be a maximum of 2A each! This is given for nearly all smoke generators for 1:16 scale available on the market.

If your smoke generator is designed for a specific voltage, set the correct voltage for your smoke generator in the **EIMod App** BEFORE you put it into operation.

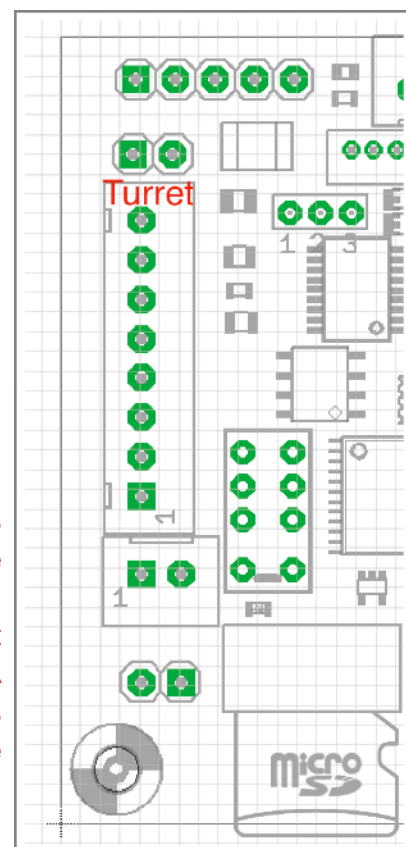
Shot function and turret components

Basically, all HengLong®/Taigen® barrel recoil or firing systems work as soon as the 8-pin turret cable is connected to the "Turret" connector. Then the barrel recoil or firing device is active as long as the "trigger" is pulled. Depending on the assignment of the connectors and the setting in the **EIMod App** extensions of this basic function are given.



Detailed instructions for wiring the turret components in different types of tanks can be found in our knowledge database in the service area at www.elmod.eu or by scanning the QR code.

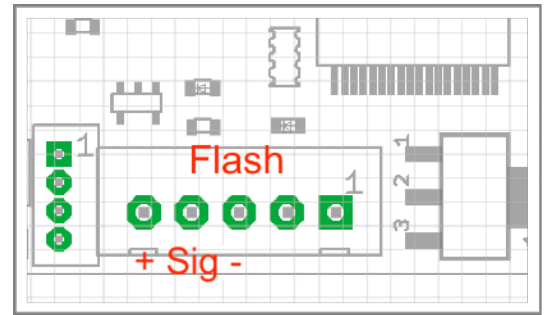
All turret components are always supplied with full battery voltage. If motors with a lower voltage are used, the voltage must be reduced by adjusting the maximum speed in the EIMod App. For example, if a 7.2 V motor is used together with a 12 V battery, the maximum speed setting for this motor must be set to 60%. Note that the maximum current for the turret motors is 1.5 A per motor. This is the case for nearly all commercially available 1:16 models with correctly functioning mechanics. Higher currents can damage the electronics.



Muzzle flash

The Taigen®/HengLong® muzzle flash is equipped with a 5-pin connector. They may be attached directly to the "Flash" connector. The Tamiya® Xenon flash is not supported.

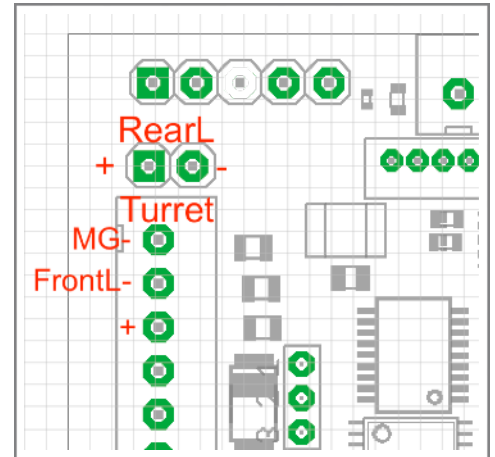
You can also connect any bright LED directly to this connector: the cathode of the LED goes to the "-" connector, the anode to the "Sig" connector.



Lighting

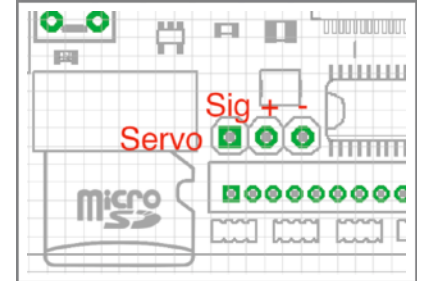
EIMod FusionX can control the following light channels:

- Front lighting (one or two white LEDs) and MG muzzle flash (one bright, warm white LED) at the "Turret" connector. This connector has a dimming function with 100 brightness levels. The cathodes of the LEDs are connected to the MG- or FrontL- terminals, and the anodes are attached together to the + terminal.
- Combined taillight/stoptlight (one or two red LEDs). This connection has a separately adjustable dimming function for the tail light and brake light, each with 100 brightness levels. The anode is connected to the + terminal, the cathode to the - terminal.
- If more than one colored LED is used on one of these connections, they can be connected in series. If white LEDs are used, they have to be connected in parallel.
- Additional light channels can be added via the additionally available [EIMod FX Expander](#).



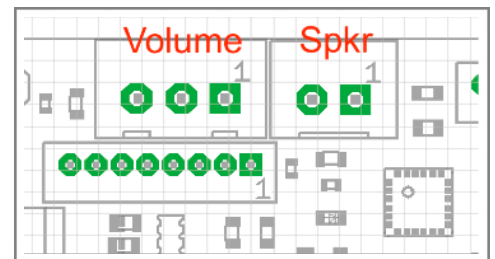
Servo

EIMod FusionX has a servo connector for a standard servo that can be used for a variety of functions. For example tube recoil simulation, control of a steering axis or opening/closing of a hatch. The maximum current at the connector is approx. 300mA (corresponds to a micro servo of the 9g class) You can find further instructions about the configuration of the servo in our knowledge base in the service area at www.elmod.eu or by scanning the QR code.



Sound function connection

- Connect the supplied volume control to the "Volume" connector.
- EIMod FusionX features the optional control of the master volume over the RC radio. In this case, the corresponding parameter must be set in the [EIMod App](#) (tab "Volume", parameter "Volume control" to "external"). The internal volume control is deactivated then and the "Volume" connector can remain unconnected.
- Connect the loudspeaker cable to a suitable 8 Ohm loudspeaker and connect it to the connector "Spkr". The polarity of the speaker (+/-) does not matter here.
- Install the loudspeaker in an airtight enclosure lined with damping material and with as large a volume as possible. More information on this topic can be found in our knowledge base (link and QR code can be found at the end of these instructions).
- Connect a fully charged battery to the [EIMod FusionX](#) and wait until the blue LED starts blinking.
- Now quick tap the setup button. A test announcement will sound from the speaker.
- If it does not, check whether the volume is possibly set too low.



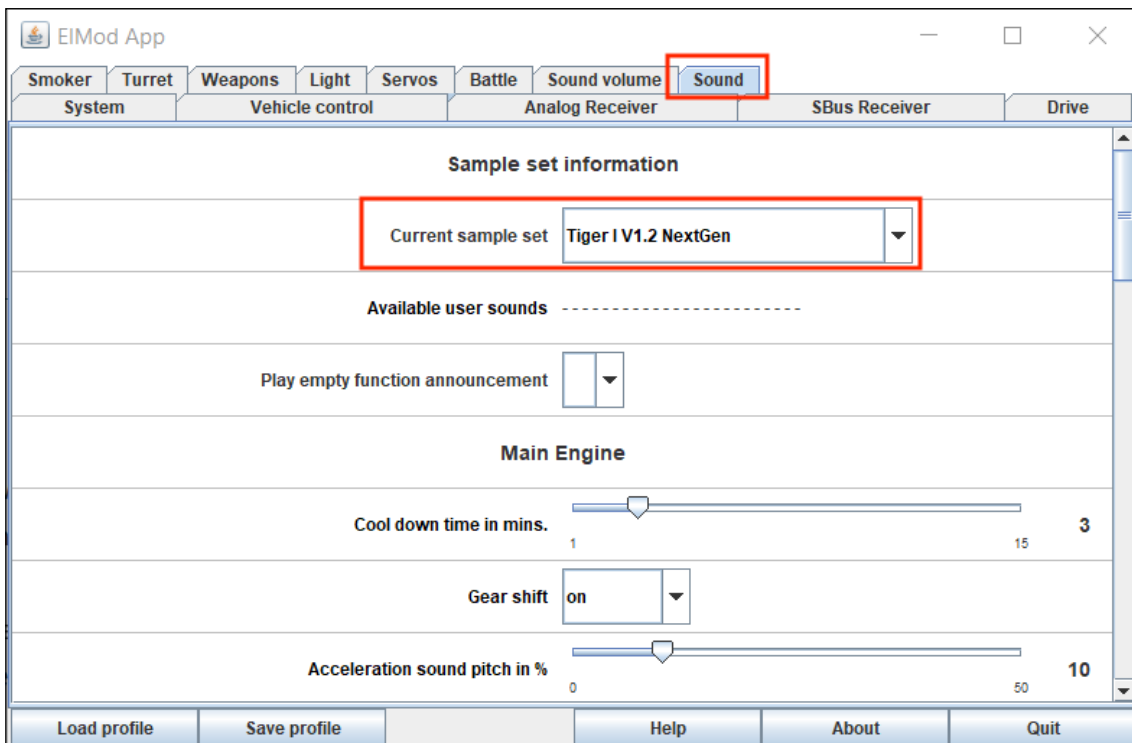
Other connectors

EIMod FusionX offers further connections for expansions:

- Connector "Exp": with the optionally available [EIMod FX Expander](#) servo functions and additional light channels can be added
 - Auxiliary MG muzzle flash.
 - Three freely usable light sources for one or two LEDs.
 - Turn indicator/warning flasher for one or two LEDs each for the left or right turn blinker.
 - Up to three servos for different functions like barrel recoil, vertical and horizontal movement of the main gun, steering, opening and closing of moving parts, and many more.
- Connector "Exp2" can be used for connecting an SBus compatible receiver (requires [EIMod FX SBus](#)).
- "Battle" connection. With [EIMod FX Battle](#) several IR Battle systems can be used:
 - Tamiya Battle Unit®
 - HengLong Battle System®
 - Taigen Battle System®

Sound set selection

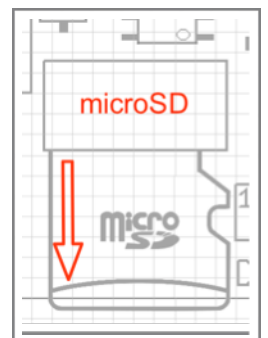
The included microSD card contains ready-to-use sound sets for different model types (tanks, half-tracks, trucks, etc.). In the delivery state, the sound set of a German Panzer VI Tiger is activated. To activate another sound set, start the [EIMod App](#) and select the desired sound set from the drop-down box in the "Sound" tab. The sound set is active, as soon as you hear the announcement "ready".



Alternatively, you can connect the microSD card to a computer and use the [Sound Manager](#) program to make the selection. This program is located directly on the microSD card and it does not require installation. [Sound Manager](#) also allows you to set the custom sounds and make other changes to the sounds.

To remove the microSD card, gently pull it out of the slot in the direction shown.

Never pull the card in an other direction than that illustrated! This can lead to permanent mechanical damage to the card holder and thus to the destruction of the electronics!



Installation

When choosing the installation location, note the following:

- Make sure that short circuits are excluded. No live parts may touch each other. Insulate all open cable connections.
- Keep live cables, especially the cables to the drive motors and battery as short as possible to minimize interference.
- Make sure that the antenna of the receiver is not located inside shielded metal walls (e.g. in the hull of a model) or between power consumers (motors). This can cause drastic decrease of the radio signal, loss of radio communication and loss of control over the model. [EIMod FusionX](#) is equipped with fail-safe mechanisms to help detect radio signal failure. However, receivers may react unpredictably to a loss of radio connection, depending on the manufacturer and settings, and e.g. continue to output the last correctly received signal.

Start-up

- Make sure that all cables have been routed correctly.
- Switch on the radio transmitter.
- Insert a fully charged battery and switch on the vehicle.
- After a couple of seconds you'll hear the announcement "ready". The system is now operable.
- If the blue LED blinks regularly, it indicates the searching for a receiver signal.
- The blue LED will stay on once the receiver signal has been identified and the number of active channels has been set, or a command has been made via the vehicle control in the [EIMod App](#).
- Start the engine and drive off!

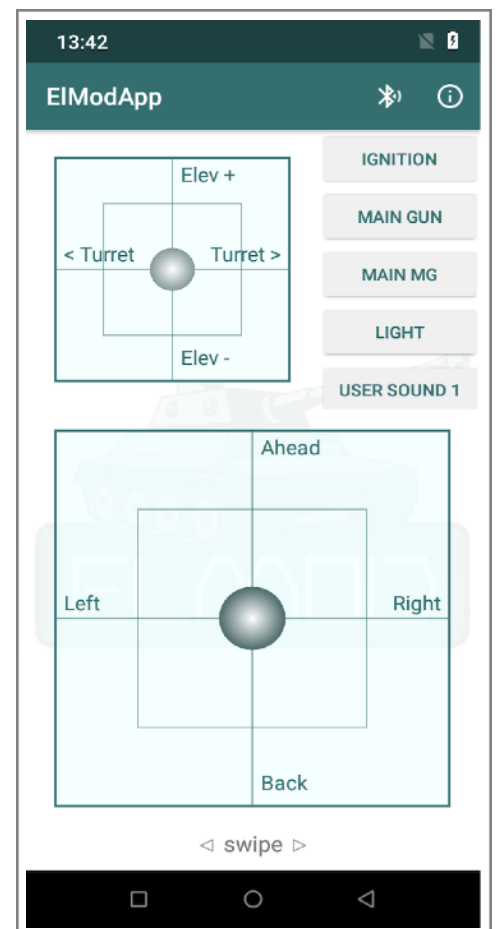
Control by computer or Android®

[EIMod FusionX](#) can be controlled via a Windows®, Apple® computer or Android® smartphone/tablet. This requires the optionally available EIMod Bluetooth, which is connected to the "USB/BT" connector. For setting up the parameters or testing the functions, the vehicle may also be controlled using the USB connection (not available for the Android® App).

Control via the computer/smartphone is disabled as long as another receiver is connected.

Control over SBus

With the help of the optional [EIMod FX SBus](#), up to 16 channels can be used via just one plug connection to an SBus-compatible system. Four channels are assigned to basic functions and one channel can be used for the master volume control. The remaining 11 channels can be freely assigned with a total of 44 functions.



Control over analog receiver

EIMod FusionX can be operated on a standard radio system with an analog receiver (proportional receiver). A maximum of eight channels are supported, which should preferably be equipped with rotary knobs or at least 3-position switches. The power supply of the receiver is integrated, so that no receiver battery is necessary. The number of connected channels is determined automatically. For correct detection and optimal function, all mixers must be deactivated, the maximum servo travel must be 100% and the trim must be centered.

For the first start-up we recommend to connect only the power supply and the channels 1 to 4.

Depending on the system, it may be necessary to adjust the channel sequence or activate servo reverse. Read the instructions for your radio remote control for details. Leave the wires of unused channels disconnected.

Color	Channel	Function	Control
Main functions			
red/black	-	5V power supply (BEC)	
brown	1	Acceleration	Right stick
orange	2	Steering	
yellow	3	Gun elevation	Left stick
green	4	Turret rotation	
Extended functions			
blue	5	Functions on the left stick	Rotary knob or at least 3-position switch (reduced functionality)
pink	6	freely assignable (up to 4 functions)	
grey	7	freely assignable (up to 4 functions)	
White	8	Master volume	Rotary knob

If you are having trouble detecting and operating your radio with the EIMod FusionX, the EIMod App provides all necessary status information. Troubleshooting assistance can also be found in our knowledge base or by scanning the QR code. Alternatively, contact your dealer's support who will be glad to assist you.



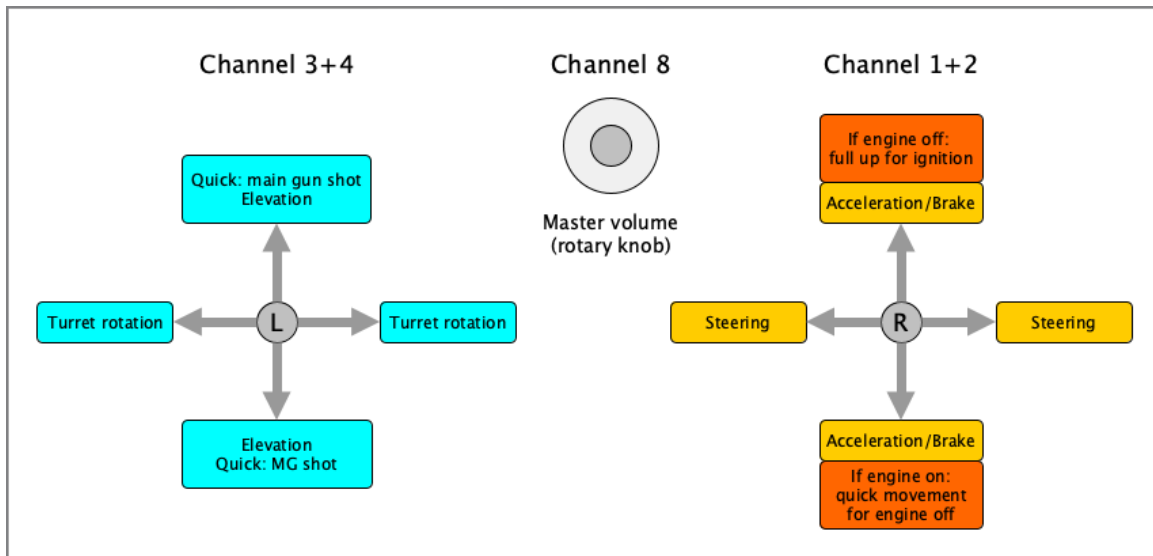
Basic functions

All basic functions can be operated with just four channels. Optionally, the volume can be adjusted via a rotary knob on channel 8 (white wire).

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 axles).



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](#).

Extended functions

The assignment of the left control pad can be influenced via a rotary control on channel 5. Channels 6 and 7 can be assigned up to eight functions. In total up to 40 functions may be assigned.

A detailed description of this advanced control can be found in our knowledge base or by scanning the QR code.



Status LEDs

The blue status LED and red error LED located on the board indicate the current operating status of the [EIMod FusionX](#).

LED1 blue	LED2 red	Description
on	off	Ready for operation. Blue LED flickers briefly as soon as a command is received.
blinks	off	No receiver signal detected or signal faulty
off	on	Undervoltage or overvoltage shutdown active
on	on	No SD card inserted, card or its contents faulty (operation still possible, but only with default settings and without sound).

Installation of the EIMod App

With the help of the free [EIMod App](#), it is possible to customize the electronics to your specific model. The software is available for Microsoft® Windows®, MacOS® and Android®. It can be used to set a wide range of parameters and read out information about the operating status. Furthermore, firmware updates can be uploaded (not for Android®). When installing the software, it may be necessary to ensure that any virus protection software or other security settings do not prevent access to the USB hardware or block the execution of the program.

With 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 in the service area of our website (www.elmod.eu).

Under MacOS® the driver is already integrated in the system. To run the [EIMod App](#) under MacOS® it is necessary to explicitly allow the execution of the program. To do this, click in the System Preferences under Security on "Allow apps download from: App Store and verified developers". When running the [EIMod App](#) for the first time, the permission must be confirmed again. This only needs to be done once.

To connect your computer to the [EIMod FusionX](#), use the included USB dongle and USB cable:

- Connect the USB dongle to the "USB/BT" connector of the [EIMod FusionX](#), on the other side to a free USB port of your computer. A wireless connection is also possible with the optionally available [EIMod Bluetooth](#).
- Turn on the [EIMod FusionX](#) and connect it to a computer.
- Now start the [EIMod App](#).
- After two to ten seconds, the [EIMod FusionX](#) will be found and the current settings will be transferred.

In the [EIMod App](#), a wide range of settings can be made and a wide range of information can be obtained. The program window is divided into 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 hover 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.

Setting of driving parameters

The factory settings of the [EIMod FusionX](#) fit a 1:16 scale armored vehicle weighing up to 5 kg. Due to the variety of models and mechanical designs, it may be necessary to adjust the driving parameters. A detailed description of this can be found in our knowledge base (link and QR code can be found at the end of these instructions).

Reset to factory defaults

To reset all settings to factory values proceed as follows:

- Switch off the voltage and wait a couple of seconds. 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 10 sec the blue LED and the red LED light up together.
- Release the setup button. All parameters are set to delivery condition.

Firmware update

The firmware of the **EIMod FusionX** is done through the **EIMod App**. The newest firmware version is 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.

For updating the firmware the **EIMod FusionX** 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 FusionX**. 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.

Additional information

A number of further articles about the **EIMod FusionX** can be found in our knowledge database in the service area at www.elmod.eu or by scan of the QR code.



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 11.1V 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.

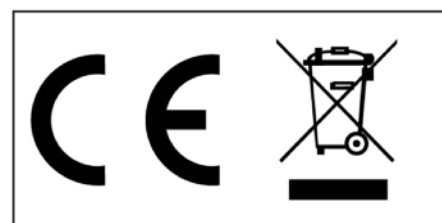
WARRANTY CONDITIONS

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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<http://www.elmod.eu>