

Control with an analog receiver EIMod FusionX, EIMod 4WD

Requirements

ElMod FusionX and ElMod 4WD are delivered with a cable for connection to an analog receiver. With this, all commercially available 2.4GHz as well as all older 40MHz systems can be connected.

You need at least two channels to control the vehicle: throttle and steering. It is usually the right stick on the radio. With these two channels the engine can be "started", "stopped" and the vehicle can be driven (throttle, brake, steering).

We recommend to connect only these two channels during the first tests to check the basic function of the radio system and the central unit.

A rotary control on the radio system can be used to control the volume. If the radio system does not have a rotary control, the volume is set by default using a rotary control provided with the central unit.

Two additional channels (usually assigned to the left stick) are used by ElMod FusionX to control the turret (turret rotation and the elevation of the main gun). Additionally, it can be used to fire the main gun and a machine gun. With an optional additional channel (a knob or with functional restrictions also a switch) you change the function assignment of the left stick. This is then no longer assigned with turret functions but with other functions such as lights, turn signals, user sounds etc.

With EIMod 4WD a second stick is not necessary. If this is present, various additional functions are located there, which can be changed at will.

All other channels can be freely assigned with different functions. In total, up to eight channels can be used. The highest flexibility is achieved when all channels are equipped with rotary controls. 3-way switches or on/off switches can also be used, but the possible number of assignable functions is reduced.

Connection of the receiver

The supplied cable for the receiver has a total of nine plugs:

One plug with two wires (red/black) is the power supply for the receiver with 5V (BEC). This plug must always be attached. Some receivers do not have a separate connector for it. In these cases, any other socket of the receiver (channel 1 to 8) can be used.

The remaining eight plugs are connected with channels 1 to 8 of the receiver. For correct operation, only connect channels that are actually used.

The actual order varies from radio to radio. Depending on the equipment and model, it may differ from the ElMod assignment. A typical case for this is the volume control, which does not always have to be on channel 8 on the receiver. For example: if the rotary control of your radio is assigned to channel 6 of your receiver, the white line from ElMod channel 8 must be connected to channel 6 on the receiver.

The assignment of channels in ElMod FusionX is as follows:

Function	Color	ElMod Channel	Control
Acceleration/braking	brown	1	Chield
Steering	orange	2	Stick
Main gun elevation / shot*	yellow	3	Chiele
Turret rotation*	green	4	Stick
Function selection for channel 3+4	blue	5	Knob or switch
Channel for quick access functions	violet	6	Knob or switch
Channel for quick access functions	gray	7	Knob or switch
Volume control	white	8	Knob

*Depending on the position of channel 5 (blue), the control pad (channels 3 (yellow) and 4 (green)) is assigned other functions. This is explained further in the text.

The assignment of channels in ElMod 4WD is as follows:

Function	Color	ElMod Channel	Control	
Acceleration/braking	brown	1	Chausedway	
Steering	orange	2	Steuerkreuz	
Channel for quick access functions	yellow	3	Stick knob or owitch	
Channel for quick access functions	green	4	Slick, knob of Switch	
Channel for quick access functions	blue	5	Knob or switch	
Channel for quick access functions	violet	6	Knob or switch	
Channel for quick access functions	gray	7	Knob or switch	
Volume control	white	8	Knob	

The ElMod channels 1 to 4 (brown, orange, yellow, green) correspond in most cases to channels 1 to 4 on the receiver. In the domain of model aircraft it corresponds to Mode 1: "Throttle right".

Configuration of the RC radio

Before the radio system can be used, it must be configured correctly. Many radio systems offer a very large variety of functions. Most of them are not needed for driving a vehicle and are intended for model aircraft. The following points must be considered:

- Only channels that are actually needed to control the vehicle are to be assigned at the receiver. For example, if the receiver has sockets for 8 channels, but the transmitter only has two sticks assigned to channels 1 to 4, then the status of channels 5 to 8 is not defined. This often leads to disturbances in operation such as random triggering of different functions. In this case, only the four channels actually used may be wired.
- All controls must be in the neutral position (sticks centered, knobs and 3-way switches in the center position, on-off switches in the off position). The only exception is the rotary control for the volume which can be in any position.
 It is possible that the center position of a control on the transmitter does not correspond to the actual neutral position.
 Often the neutral position can be shifted in the transmitter, e.g. by trimming.
- All mixers must be deactivated. A control element (switch, knob..) may only affect the signal of one channel. This is normally the standard case.
- The actuation travel of the individual channels must be approx. -100% to +100%. The lowest position of a control corresponds to -100%, the highest corresponds to +100%. For the sticks in the horizontal direction, it is -100% on the left, +100% on the right.

To check the settings of the radio system, the ElMod app can be used. All the information required for this is in the "Analog receiver" tab:

- the parameter "Connected channels" shows which ElMod channels detect a signal from the receiver. If an '-' is displayed instead of a number, either the associated cable is not connected to the receiver or there is no signal.
- The parameters "Position channels 1 to 4" and "Position channels 5 to 8" show the position of the corresponding control element. This is what you can see:
 - Which control element is assigned to which channel. To do this, change the position of a control element (e.g. switch or knob) and observe which number changes. Remember that a stick is always assigned to two channels. If the stick is moved diagonally, the values for two channels will change simultaneously. So move the stick first only vertically and then only horizontally to see if the wiring of channel 1 (brown, throttle) and channel 2 (orange, steering) matches
 - Whether a control element reacts in the correct direction. If a switch, a stick or a knob is moved upwards (when horizontal, to the right), the value for the position must change to positive. If it is moved downwards (when horizontal, to the left), the value goes into the minus range. If it is the other way around, the direction of movement must be "reversed" (also known as "servo reverse" or "channel reverse"). Most radio systems offer such a setting. It is also provided in the ElMod App for all channels individually.
 - Whether a control is deflected far enough. The displayed value should be between -100% and +100% (+110% to -110% is also OK). If this is not reached, the entire usable range of the channel cannot be utilized. The vehicle can then not reach full speed, for example. In this case, the servo travel must be extended at the radio control. If -100% or +100% is reached well before the limit stop, the servo travel for this control element should be reduced at the radio control.
 - Whether mixers are activated. This is the case if the values of more than one channel are changed when a control is moved. In this case, deactivate the mixer on your radio control.

In a correctly set radio system, in the idle position all channels are at 0% (except the volume knob), operating a control changes the value of only one channel. This value goes from -100% to +100%. Here -100% is at the lowest or left position and +100% is at the highest or right position.

In the picture below you can see that all channels except 6 (violet) and 7 (gray) are connected (parameter: "Connected channels"). All channels except the volume (channel 8, white) are in the neutral position. The knob on channel 8 (white), is set to 87%.

ElMod App								
Analog Receiver SBus Receiver Drive Smoker Turret Weapons Light Servos Battle >								
	Connected channels	1234	5 – –	8				
	Position channels 1 to 4	0%	0%	0%	0%			
	Position channels 5 to 8	0%	0%	0%	87%			

In the following image, full throttle was applied to the right stick. Now channel 1 (brown) is at approx. +100%.



In the next image, the throttle is removed again (0% for channel 1, brown), but the steering is maxed on the left: approx. -100% for channel 2 (orange).

(• • •	ElMod	l App					
	Analog Receiver	SBus Receiver Drive Smoker	r Turr	et Wea	ipons L	ight	Servos	Battle 🕨 🕨
Connected channels 1 2 3 4 5 8								
		Position channels 1 to 4	0%	-103%	0%	0%		
		Position channels 5 to 8	0%	0%	0%	87%		

Now the turret rotation (channel 4, green) was actuated to the left. The ElMod App shows a positive deflection: here, the channel 4 (green) must be reversed.

(• • •	ElMod	Арр					
	◄ Analog Receiver	SBus Receiver Drive Smoker	Turret	Weap	ons	Light	Servos	Battle 🕨 🕨
		Connected channels	L 2 3 4	5	8			
		Position channels 1 to 4	0%	0%	0%	101%		
		Position channels 5 to 8	0%	0%	0%	87%		

After changing the parameter "Channel 4 (green) Reverse" the indicator is now correct: when deflecting to the left the value is negative.

ElMod App					
Analog Receiver Drive Smoke	r Turret Weapons Light Servos Battle 🕨				
Connected channels	1 2 3 4 5 8				
Position channels 1 to 4	0% 0% 0% <mark> - 99</mark> %				
Position channels 5 to 8	0% 0% 0% 87%				
Left stick assigned to	main turret functions (Channel5: 0%)				
Channel 1 (brown) mode	Acceleration and ignition 😌				
Channel 1 (brown) reverse	disabled 😌				
Channel 2 (orange) reverse	disabled 😌				
Channel 3 (yellow) reverse	disabled 😌				
Channel 3 (yellow) mode	Gun elevation and weapon control 📀				
Channel 4 (green) reverse	enabled 📀				
Load profile Save profile	Help About Quit				

Basic functions

Before proceeding, make sure that your radio is properly set up according to the previous sections.

The right stick is used to control the throttle and steering. In addition, the engine is started and stopped:

- If the engine is off (e.g. after power on), the stick must be moved to the uppermost position and held briefly. The stick can be released as soon as the starter is audible.
- The engine can be switched off with the following procedure
 - the vehicle must stop and the idle speed must be reduced
 - The stick is quickly moved to the rearmost position and immediately released (it is best to pull the stick all the way down with one finger and release it).
 - The sound of an engine shutting down can be heard.

The position of the throttle stick when accelerating corresponds to the driving speed: the greater the deflection at the throttle stick, the higher the speed of the vehicle.

When braking, on the other hand, the deflection corresponds to the braking force: the further the throttle stick is in the opposite direction of travel, the greater the braking effect. If the throttle stick is

moved to the center position, the tank rolls out to a standstill (engine brake).

In ElMod FusionX, the left stick is used to control the turret and weapons:

- Horizontal: Rotate the turret to the left or right. The greater the deflection, the faster the turret rotates.
- Vertical: elevation of the main gun. The greater the deflection, the faster the gun moves. If the control pad is moved quickly all the way up, a shot is fired. If you move it down quickly, the machine gun fires.

A rotary control on channel 8 (white) can be used to change the volume. This function must first be activated in the ElMod App. The "Volume" tab contains the "Volume control" parameter. If this parameter is set to "internal" (default setting), the volume is adjusted via the rotary control connected to the ElMod central unit. In the "external" position, the volume is set via the radio system. Directly below, the current volume level is displayed to control the function.

•••	ElMod App	
◄ Drive Smoker T	urret Weapons Light Servos	Battle Sound volume Sound
	Main volume control external 📀	
	Current volume % 100	
	Motor sound volume +/-0 ᅌ	





Extended functions: ElMod FusionX

In the extended control, all channels except brown (acceleration), orange (steering) and white (volume) can be assigned a total of 40 different functions. These include:

- Turning the main light on/off
- Switching on/off the light functions of the FX Expander
 - Light 1
 - Light 2
 - Light 3
 - Blinker left
 - Blinker right
 - Warn lights
- Weapon functions
 - Trigger of the main gun
 - Trigger of the main MG
 - Trigger of the auxiliary MG
- Smoke generator on/off
- Start/stop engine
- Ambient noises on/off
- Servo functions of the FX Expander
 - Servo function Servo 1 on/off
 - Servo function Servo 2 on/off
 - Servo function Servo 3 on/off
- User sounds 1 ... 24 play/stop

Each function can also be assigned more than once.

For all these channels, a distinction is made between five positions: full down, half down, neutral, half up and full up. The full range of functions is therefore obtained when these channels are assigned with rotary controls. If they are equipped with a 3-way switch (top-middle-bottom) or an on-off switch, the number of possible positions is reduced accordingly.

The operation is done in two ways:

- Channel 5 (blue) determines which functions are located on the left stick (channels 3 (yellow) and 4 (green)). If channel 5 (blue) is in the center position, the standard functions for the turret are located on the left stick (see "Basic functions". In any other position (full down, half down, half up and full up) the left stick activates some of the functions listed above. Thus, for each position of channel 5 (blue), 8 functions are assigned to the left stick. Some of these functions are already preassigned from factory. The preassignment can be changed as desired with the ElMod App.
- Channels 6 (violet) and 7 (gray) allow quick access to a total of eight functions (four per channel)

It is important to know that after actuating a function, the control element must be returned to the neutral position (rotary control to the center, switch to the center or off position). Otherwise, under certain circumstances, no further functions can be triggered. Example: if a function is activated on channel 6 and the rotary control or switch is not moved to the center position, no other function can be switched on channel 7.

The section "Configuration of the RC radio" explains how this can be checked in the ElMod App.

The following graphic now shows the complete assignment of the left stick. This changes depending on the position of channel 5 (blue):



The logic behind this is as follows:

- Channel 5 activates higher function numbers in ascending order from bottom to top
- On the stick, the function numbers increase clockwise starting at 12 o'clock, first the "big" hand (full deflection), then the "small" hand (half deflection).

If a function is not assigned, a plain text announcement is made with the function number of the function just triggered. For example: Channel 6 (blue) is in the "full up" position and the control pad is moved to the right position. You will hear the announcement "Function 26"

Which functions are currently accessed on the left stick is listed in the ElMod App in the tab "Analog receiver" under the parameter "Left stick assigned to". See image below.

•••	EIM	od App						
Analog Receiver	SBus Receiver Drive Smok	er Turre	t Weap	ons	Light	Servos	Battle	•
	Connected channels	1234	45	8				
	Position channels 1 to 4	0%	0%	0%	0%			
	Position channels 5 to 8	- 98%	0%	0%	87%			
	Left stick assigned to	F1 to F8 (0	Channel5: -	- 100%)				

Channels 6 (violet) and 7 (gray) can be assigned to frequently used functions and are assigned as follows:



Here the function numbers increase from bottom to top.

In the example below, the starter motor and the additional MG have been placed on channel 6 (violet). The starter motor is activated when the switch or knob on channel 6 (violet) is moved to the lowest position. The auxiliary MG fires in the uppermost position of the control.

ElMod App						
Analog Receiver SBus Receiver Drive Smoker Turret Weapons Light Servos Battle						
Function 32 (half left) not used						
Functions 33 - 36 (Channel 6, violet)						
Function 36 (full up) Aux MG (Expander)						
Function 35 (half up) not used						
Function 34 (half down) not used						
Function 33 (full down) motor on/off 📀						
Functions 37 - 40 (Channel 7, grey)						
Function 40 (full up) not used 📀						
Load profile Save profile Help About Quit						

The ElMod App offers in the tab "Analog receiver" even more options for configuration:

- It is possible to deactivate the starter function on the throttle. This is desired if, for example, the starter is set to a quick access function on channel 6 (violet) or channel 7 (gray).
- It is possible to disable the weapon function on channel 3 (yellow). Then only turret rotation and elevation of the main gun are on the left stick. The weapons are then triggered, for example, as quick access function on channel 6 (purple) or channel 7 (gray).

ElMod App						
System Vehicle contro	Analog Receiver SBus	Receiver Drive	Smoker	Turret	Weapons	
	Position channels 5 to 8	0% 0%	0%	87%		
	Left stick assigned to	main turret function	s (Channels	5: 0%)		
	Channel 1 (brown) mode	Acceleration and ig	nition ᅌ)		
	Channel 1 (brown) reverse	disabled 📀				
	Channel 2 (orange) reverse	disabled 📀				
	Channel 3 (yellow) reverse	disabled ᅌ				
	Channel 3 (yellow) mode	Gun elevation and v	veapon con	itrol ᅌ		
	Channel 4 (green) reverse	disabled ᅌ				
Load profile Save	profile	Help	Abo	out	Quit	

Extended functions: ElMod 4WD

In the extended control, all channels except brown (acceleration), orange (steering) and white (volume) can be assigned a total of 20 different functions. These include:

- Turning the main light on/off
- Switching on/off the light functions of the FX Expander
 - Light 1
 - Light 2
 - Light 3
 - Blinker left
 - Blinker right
 - Warn lights
- Weapon functions
 - Trigger of the main gun
 - Trigger of the main MG
 - Trigger of the auxiliary MG
- Smoke generator on/off
- Start/stop engine
- Ambient noises on/off
- Servo functions of the FX Expander
 - Servo function Servo 2 on/off
 - Servo function Servo 3 on/off
- User sounds 1 ... 24 play/stop

For all these channels, a distinction is made between five positions: full down, half down, neutral, half up and full up. The full range of functions is therefore obtained when these channels are assigned with rotary controls. If they are equipped with a 3-way switch (top-middle-bottom) or an on-off switch, the number of possible positions is reduced accordingly.

It is important to know that after actuating a function, the control element must be returned to the neutral position (rotary control to the center, switch to the center or off position). Otherwise, under certain circumstances, no further functions can be triggered. Example: if a function is activated on channel 6 and the rotary control or switch is not moved to the center position, no other function can be switched on channel 7.

The section "Configuration of the RC radio" explains how this can be checked in the ElMod App.

The following figure shows the distribution of the functions. Channel 3 (yellow) and channel 4 (green) are preassigned with light and weapon functions, as well as with light functions of the FX Expander.



If channels 3 (yellow) and 4 (green) are assigned to the left stick, the following assignment results:



Die ElMod App bietet im Reiter "Analogempfänger" noch weitere Möglichkeiten der Konfiguration :

The ElMod App offers in the tab "Analog receiver" even more options for configuration:

- It is possible to deactivate the starter function on the throttle. This is desired if, for example, the starter is set to a quick access function on channel 6 (violet) or channel 7 (gray).
- Channels 3 (yellow) and 4 (green) can be assigned to turret functions and weapons (as with ElMod FusionX). The following possibilities are provided:
 - Channel 3 (yellow):
 - Functions F1 bis F4 (default setting)
 - Elevation of the main gun
 - Elevation of the main gun and shot functions
 - Channel 4 (green)
 - Functions F5 bis F8 (default setting)
 - Horizontal aiming of the main gun or turret rotation

ElMod App					
System Vehicle control	Analog Receiver SBus	Receiver Drive	Weapons Light	Servos 🕨	
	Position channels 5 to 8	0% 0%	0% 0%		
	Channel 1 (brown) mode	Acceleration and ignit	tion ᅌ		
	Channel 1 (brown) reverse	disabled ᅌ			
	Channel 2 (orange) reverse	disabled ᅌ			
	Channel 3 (yellow) reverse	disabled ᅌ			
	Channel 3 (yellow) mode	Funcs F1 to F4	0		
	Channel 4 (green) reverse	disabled ᅌ			
	Channel 4 (green) mode	Funcs F5 to F8 📀			
Load profile Save pro	ofile	Help	About	Quit	

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