MLP4DSM

Alternative Firmware

6 Channel Transmitter with DSMX Technology

4 Model Memory for Airplanes and Helicopters

Table of Contents

1 Introduction

The alternative firmware for MLP4DSM has an extended functionality vs. the original firmware. This manual explains the use of the MLP4DSM with the alternative firmware.

2 Features off the firmware

2.1 Common features

- DSM2, DSMX and France RF mode.
  The transmitter can be switched to DSMX (Auto), DSM2 and France RF mode.
- 2 Flight modes:
  NORM - Normal/ hovering /slow speed circles,
  STUNT - aerobatic /3D
- configurable stick input Reversing
- Dual Rate – Stick rate can be set for both flight modes independently.
- Expo – Exponential rate can be set for both flight modes independently.
- Model memory for 4 models
- 3 Model types: Classic, Airplane and Helicopter.
- Countdown Timer

2.2 Special functions for Helicopter

- 3 Point curve for throttle
  for each flight mode a separate throttle curve can be configured.
- 3 Point curve for pitch
  for each flight mode a separate pitch curve can be configured.
- Throttle Cut

2.3 Special functions for airplane

- 3 Mixers
  the output cannels for Aileron, Elevator and AUX 1 will be controlled by a 3 channel mixer. The mixers can be configured for each flight mode independently.

3 Warnings

- ModelMatch will only work if the transmitter (RF) module supports is. There is a chance to select the wrong model memory.
  Before flying please verify that you model does react proper to your control commands.

- The MLP4DSM a short range transmitter intended to be used within buildings.
  Do not use the MLP4DSM to control larger outdoor models.
- Before each flying session, and especially with a new model, it is important to perform a range check.
- Except when binding, always turn on your transmitter first.
- Make sure you throttle stick is at the lower position before turning on you model.

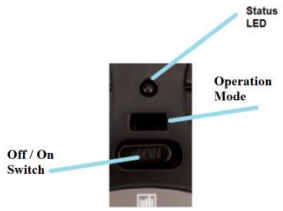
4 Transmitter operation

4.1 Installing the Batteries

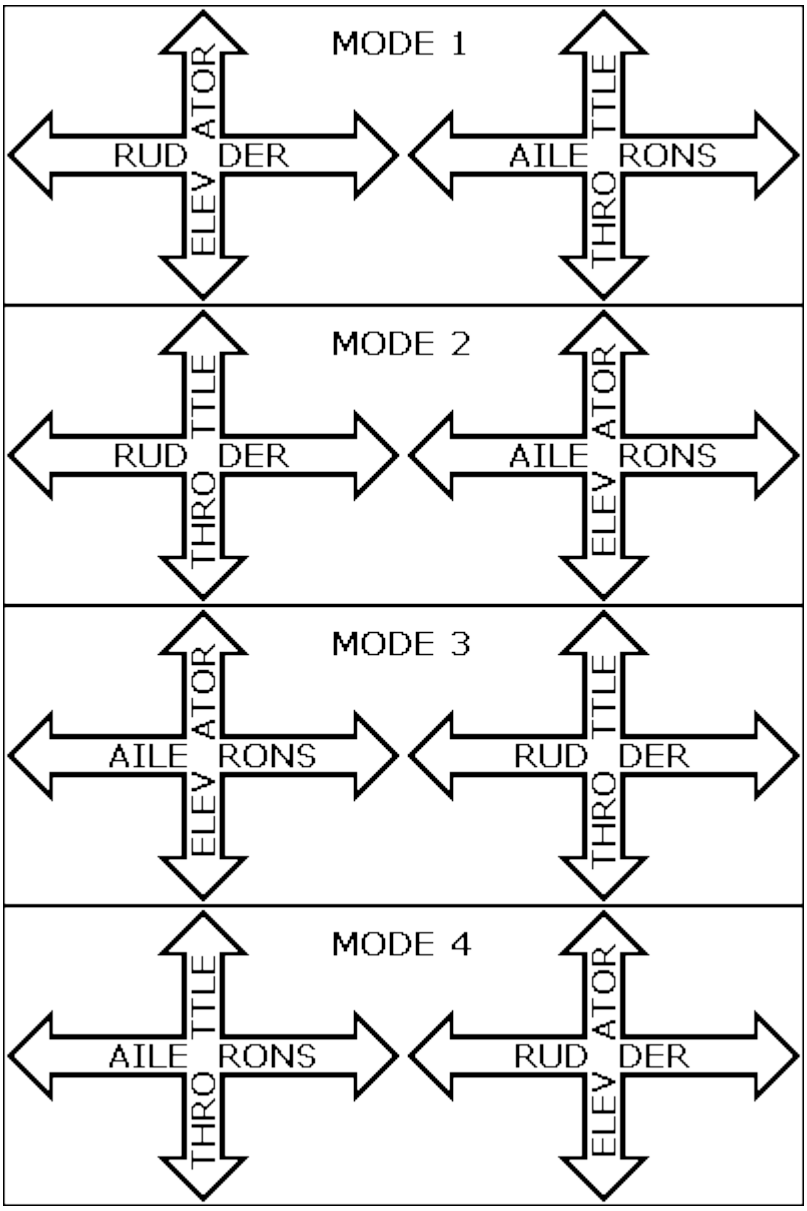
Install 4 AA batteries as shown on the picture.
Verify operation by turning on the power switch.
You hear a welcome melody and the LED is on.

4.2 Transmitter controls

The function of the sticks depends on the input mode (1 to 4).
Both sticks contain a button.
You need to push on the top of the stick to activate that button.
The left stick contains the bind button. The right stick contains the flight mode toggle switch.



Turn off your transmitter if not using.
In case you are not using your transmitter for a longer time, remove the batteries.
Warning: drained out batteries can permanently damage you transmitter.
Use the operation mode switch to switch between operation modes Normal (right) and Programming (left).



4.3 Digital trimming

Use the trim buttons to adjust the center position of the stick channel.

You hear a confirmation beep when hitting a trim button.

-The full range position of the stick is not affected by the channels trim.

-If the trim is zero you hear a double beep.

-A special sound is used that you reached the upper or lower end of trim range.

-The trim range is +/- 15° and can be adjusted in 30 steps for each direction.

4.4 Reversing a Stick direction

The default orientation of the sticks is that the maximum is at the upper left corner and the minimum in the lower right corner.

If required you can invert a channels direction.

You can change the channels direction by holding the trim buttons while powering up transmitter.

The upper/left Trim will activate channel reversing for that channel.

The lower/right Trim will deactivate channel reversing for that channel.

- Push and hold the Trim button
- Turn on your transmitter while holding the button.
- After about 1s you hear a confirmation sound
- Release the Trim button.

Four examples:

Upper Nick Trim Button – Nick direction is normal
Lower Nick Trim Button – Nick direction is inverted
Left Roll Button – Roll direction is normal
Right Roll Button – Roll direction is inverted

4.5 Flight mode

The MLP4DSM supports two flight modes:

-NORM - Normal/ hovering /slow speed circles,

-STUNT - aerobatic /3D

To switch between these two flight modes push the right stick.

While STUNT mode is active the LED is flashing.

4.6 First use of the new firmware

When using the transmitter the first time after flashing the firmware please perform the following steps.

1. Insert batteries
2. Turn on transmitter and check that LED is on.
3. Switch to programming mode (see configuration)
    a. Reset to factory default
    b. Select model memory 1.
    c. Set model type to classic
    d. Save changes
4. Switch back to normal operation.
5. Bind to your receiver (see binding)
6. Check sticks center and range. Perform a stick calibration if required.

4.7 Binding Transmitter and Receiver

Binding is the process of teaching the receiver the specific code of the transmitter so it will connect to that specific transmitter.

Follow these steps.

- Set your model / receiver to bind mode.

  To do so, read the manual of your receiver / model.
- Push and hold the bind button.
- Turn on the transmitter.
- You hear a permanent beep. Release the bind button now.
- You hear a series of tones, when this is over, binding shall be completed.
- If binding has failed repeat the above steps.

Notice:

Binding works best if distance between receiver and transmitter is between 0.5 and 1.5 meters.

With larger or shorter distance binding may fail.

By default the transmitter will try to bind with DSMX protocol, if the transmitter detects a DSM2 receiver it will use DSM2 automatically.

In seldom cases it may be necessary to manually switch the transmitter to DSM2.

Please read “operation in France” if using the transmitter in France.

4.8 Rang test

Before each flying session, and especially with a new model, it is important to perform a range check. The new firmware for MLP4DSM incorporates a range testing system which, when placed in the RANGE CHECK, reduces the output power, allowing a range check.

Steps:

1. Push and hold the bind button in the right stick while powering up the transmitter
2. The LED is flashing 2 times
3. Release the bind button.
4. The transmitter is now in range check mode.
5. Turn on your model.
6. Have 2-3 meters distance between you and your model.
7. Face the model with the transmitter in your normal flying position.
8. You should have total control of the model.
9. You can end range check mode by bushing the mode stick again.
10. The LED is lightning permanent.

4.9 Flight time timer

The alternative firmware contains a flight time countdown timer.

The timer starts running when the transmitter is powered up.

When the timer has ended a cyclic short beep will sound.

The actual time depends on the amount throttle you use. The set point is based on 50% throttle.

With 100% throttle time will be half. The timer preset is 3 minutes with 50% throttle.

4.10 Throttle Cut

The firmware has a throttle cut function for helicopters.

Throttle cut will be activated by pushing the bind button in the left stick.

Throttle cut allows you to safely turn of throttle in dangerous situations.

Also it allows you to test the pitch setting while motor is off.

To deactivate throttle cut hit the bind button again.

4.11 Low Battery Alarm

When the battery voltage falls below 3.7 Volts a beep will sound in short intervals and the LED will start flashing. If that happened during flight, please you model as soon as possible.

4.12 Channel order

The channel order of the output channel depends on the selected model type.

4.12.1 Channel order for Model Type Classic

With model type classic the output channel order is identical to the original firmware of the MLP4DSM.

1 THROTTLE - Throttle/Pitch Stick position
2 AILERON - Aileron/Roll Stick position
3 ELEVATOR - Elevator/Nick Stick position
4 RUDDER - Rudder/Tail Stick position
5 GEAR - Switched channel flight mode (actual Gyro Gain)
6 AUX1 - Switched channel on if bind button is pushed.

4.12.2 Channel order for Model Type Helicopter

1 THROTTLE - Output of the Throttle curve. Off when throttle cut is active.
2 AILERON - Aileron/Roll Stick after applying Expo & Rate
3 ELEVATOR - Elevator/Nick Stick after applying Expo & Rate
4 RUDDER - Rudder/Tail Stick after applying Expo & Rate
5 GEAR - Gyro Gain of current flight mode
6 AUX1 - Output of the Pitch curve.

4.12.3 Channel order for Model Type Airplane

1 THROTTLE - Throttle/Pitch Stick position
2 AILERON - Output of Mixer 1
3 ELEVATOR - Output of Mixer 2
4 RUDDER - Rudder/Tail Stick after applying Expo & Rate

5 GEAR - Switched channel toggle with bind button

6 AUX1 - Output of Mixer 3 + Gyro Gain (if configured / default 0).

The Inputs of Mixer 1 to 3 are:

1 AILERON - Aileron/Roll Stick after applying Expo & Rate

2 ELEVATOR - Elevator/Nick Stick after applying Expo & Rate

4 RUDDER - Rudder/Tail Stick after applying Expo & Rate

The default Mixer setup is:

Mixer1 100% , 0%, 0%

Mixer2 0%, 100%, 0%

Mixer3 -100% , 0%, 0%

4.13 Fast Model selection

If the option for fast model selection is on you can switch the model memory without having it turn on program mode.

For that, put sticks in the position for the model memory you want to select and then turn on your transmitter.

You hear a confirmation sound.

4.14 RF configuration for France

Die MLP4DSM has a RF Mode that meets the French regulative requirements.

The France RF mode and should only be selected if the transmitter is used in France.

To activate the France mode:

1. Switch to programming Mode (see configuration)
2. Bring Sticks in Position for France mode.
3. Push the Set button
4. Push the Store button
5. Switch back to normal mode.

5 Configuration

5.1 Programming Mode

To change the configuration of the transmitter or the model specific configuration you need to switch to programming mode.

For that, switch to mode switch to programming (left) position while transmitter is turned off. Turn on the transmitter. You hear two confirmation beeps to show that you are in the programming mode.

If the configuration option “programming while running” is on, you can switch to programming mode while the transmitter is running. The throttle stick must be at the lower position.

While in programming mode the output signals will not be updated.

Make sure your model is on ground before switching to programming mode.

5.2 Controls in Programming Mode

The Stick position is used to select the different programming options.

The trim keys have a special meaning while in programming Mode.

Set/capture: The stick position is captured and evaluated.

Plus/Minus: Increase / Decrease value.

Next: move to next entry step.

Store: The changes are stored into permanent memory.

5.3 Selecting a configuration option

1. Switch to programming Mode (if not already done)
2. Move Sticks to the position for the option you want to change.
3. Push the Set button.
4. You hear a confirmation sound.
5. You can now change further options.
6. Store your change by pushing the store button.

5.4 Entering Values

For some configuration like curves, mixers, expo and rate you must enter values.

After the configuration option you are in the value enter mode.

You now have to enter all required values for that configuration.

Two long beeps inform you, that you are in the value entering mode.

The LED tells you witch value to enter, flashing once for the first value to enter, twice for the second value to enter, and so on.

You have two options to enter a value:

1. The Throttle Stick
    a. Bring the throttle stick to the position that matches the desired value.
    b. Push Set/capture to use the throttle stick position as set point.
    c. System will automatically switch to the next entry.
2. Plus / Minus Buttons
    a. By pushing the Plus or Minus buttons you can in- / de-crease the current value by 2.5 %
    b. A beep will sound as confirmation.
    c. Special beeps indicate that you reached upper or lower end.
    d. A double beep indicates the center.
    e. Push the next button to move on to the next value to enter.

You can skip the current value and leave it unchanged be directly pushing the next button.

If all values required are entered, a series of tones will indicate the end of the input series.

You are now in the main programming menu.

Remember to save changes.

5.5 Common Settings procedure

Switch to programming mode.

Move Sticks to the position for the option you want to change.

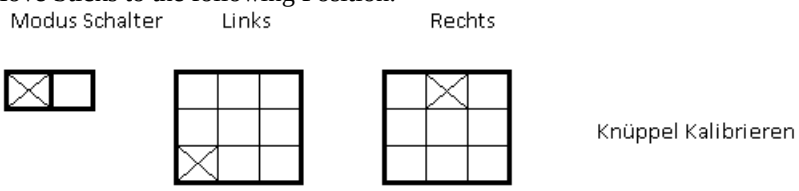
Hit Set button.

To change further settings repeat above steps

Push Save Button to save you changes.

5.5.1 Calibrating Sticks

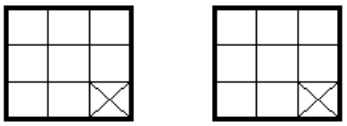
1. Switch to programming mode.
2. Move Sticks to the following Position:



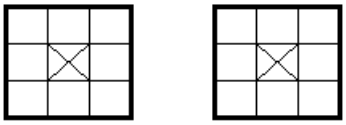
3. Push Set button

4. Move both sticks to the lower right corner and push the Set button to calibrate the min position.

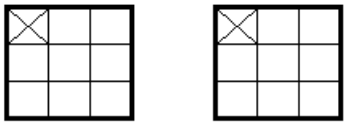
    You can skip that step by pushing the Next button.



5. Move both sticks to the center and push the Set button to calibrate the zero position.
   You can skip that step by pushing the Next button.



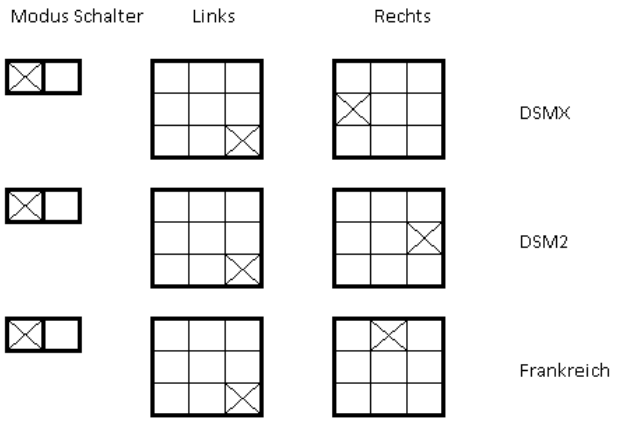
6. Move both sticks to the upper left corner and push the Set button to calibrate the max position.
   You can skip that step by pushing the Next button.



7. Push store to save the calibration.

If you know how to solder and do have a FTDI USB to TTL converter,
you can use the „DSM_Serial_Analyse“program to check calibration.

5.5.2 Selecting RF Mode / DSM2 – DSMX– France

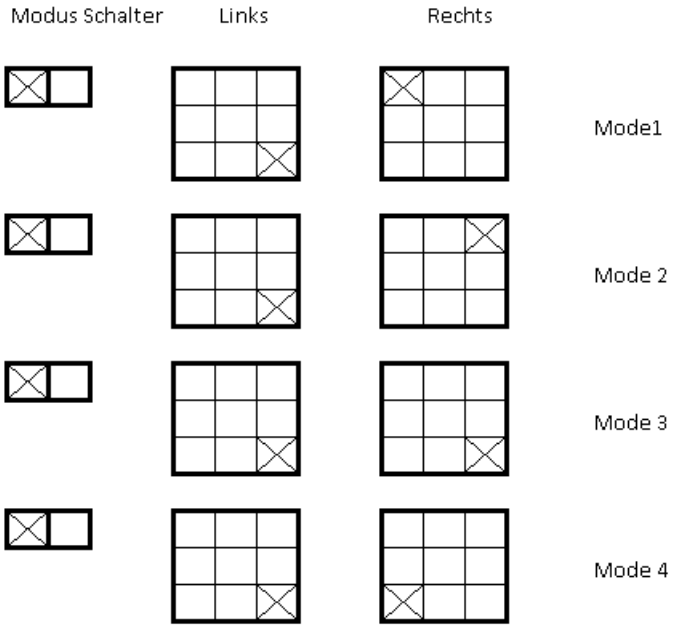


5.5.3 Configure Count Down Timer

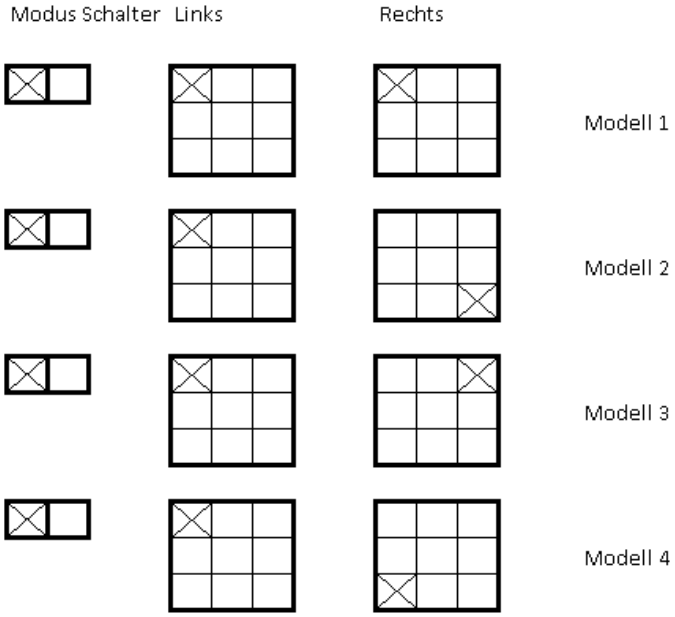
1. Switch to programming Mode.
2. Push Plus/Minus button to in- /de-crease current timer value by 15s.
3. A confirmation beep will sound.
4. Tow tones will indicate that you reached to lower or upper limit.

The timer is turned off if you set it to zero.

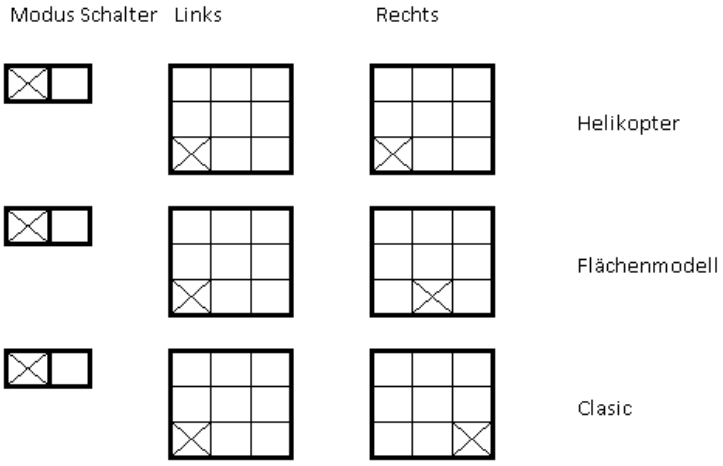
5.5.4 Changing Stick input Mode / Mode 1 - 4



5.5.5 Selecting Model Memory (1-4)

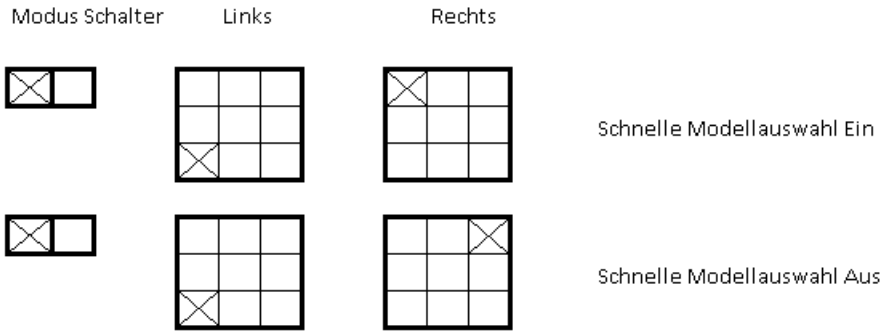


5.5.6 Chose Model Type



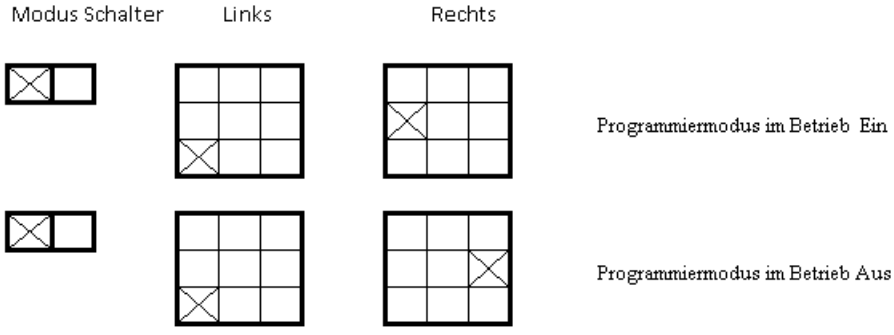
5.5.7 En-/Disable Fast Model Selection

The option “fast model select” allows you the change the model memory without entering programming mode.



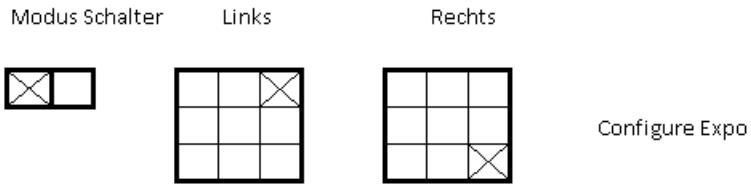
5.5.8 En-/Disable Programming mode while running

If the option “enable programming mode while running” is on, you can switch to programming mode while the transmitter is running.



Configure Expo

The Range is 0-100%



You have to enter 6 values.

The first 3 values are for the NORM mode.

The next 3 values are for STUNT mode.

1. Aileron/Roll - Expo % / MORM Modus
2. Elevator/Nick - Expo % / MORM Modus
3. Rudder/Tail - Expo % / MORM Modus
4. Aileron/Roll - Expo % / STUNT Modus
5. Elevator/Nick - Expo % / STUNT Modus
6. Rudder/Tail - Expo % / STUNT Modus

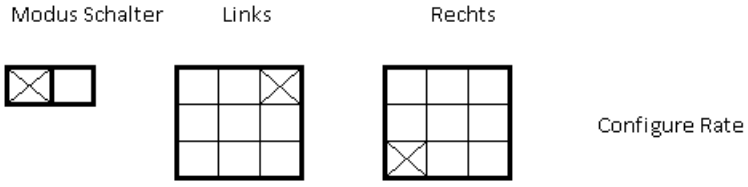
Use throttle stick or plus / minus buttons to enter the values.

See “entering values”

5.5.9 Configure Rate

The range is -125% to +125%

Negative Values will invert the channel



You have to enter 6 values.

The first 3 values are for the NORM mode.

The next 3 values are for STUNT mode.

1. Aileron/Roll - Rate / MORM Modus
2. Elevator/Nick - Rate / MORM Modus
3. Rudder/Tail - Rate / MORM Modus
4. Aileron/Roll - Rate / STUNT Modus
5. Elevator/Nick - Rate / STUNT Modus
6. Rudder/Tail - Rate / STUNT Modus

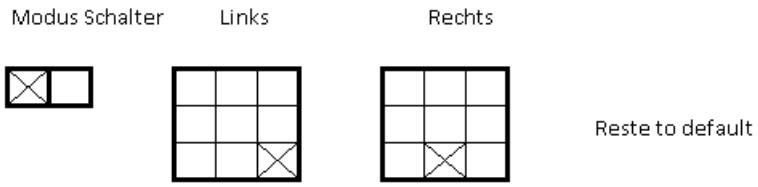
Use throttle stick or plus / minus buttons to enter the values.

See “entering values”

5.5.10 Reset Transmitter to factory default

This will reset the transmitter configuration to factory default.

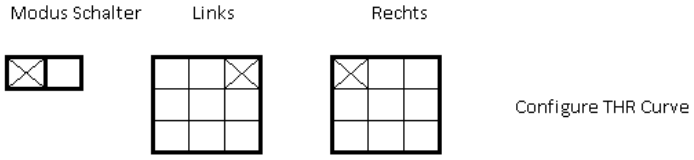
The model configuration stays unchanged.



5.6 Configuration options for Helicopter

5.6.1 Configure Throttle Curve

The Range is -125% to +125%



You have to enter 6 values.

The first 3 values are for the NORM mode.

The next 3 values are for STUNT mode.

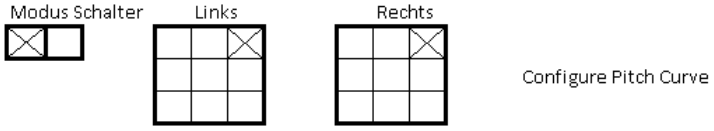
1. Throttle value for stick lower position / NORM Modus
2. Throttle value for stick center position / NORM Modus
3. Throttle value for stick upper position / NORM Modus
4. Throttle value for stick lower position / STUNT Modus
5. Throttle value for stick center position / STUNT Modus
6. Throttle value for stick upper position / STUNT Modus

Use throttle stick or plus / minus buttons to enter the values.

See “entering values”

5.6.2 Configure Pitch Curve

The Range is -125% to +125%



You have to enter 6 values.

The first 3 values are for the NORM mode.

The next 3 values are for STUNT mode.

1. Pitch value for stick lower position / NORM Modus
2. Pitch value for stick center position / NORM Modus
3. Pitch value for stick upper position / NORM Modus
4. Pitch value for stick lower position / STUNT Modus
5. Pitch value for stick center position / STUNT Modus
6. Pitch value for stick upper position / STUNT Modus

Use throttle stick or plus / minus buttons to enter the values.

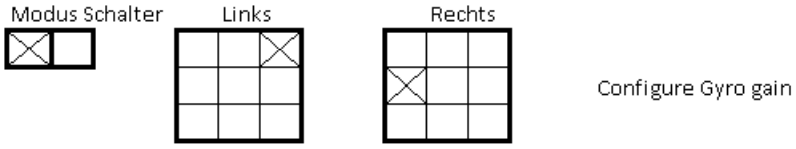
See “entering values”

5.6.3 Configure Gyro Gain

The Range is -125% to +125%.

For most Gyro the Rate Mode value must be in range -125 to 0

and for Position Lock Modus in range 0 to 125%.



You have to enter 2 values.

1. Gyro Gain / NORM Modus
2. Gyro Gain / STUNT Modus

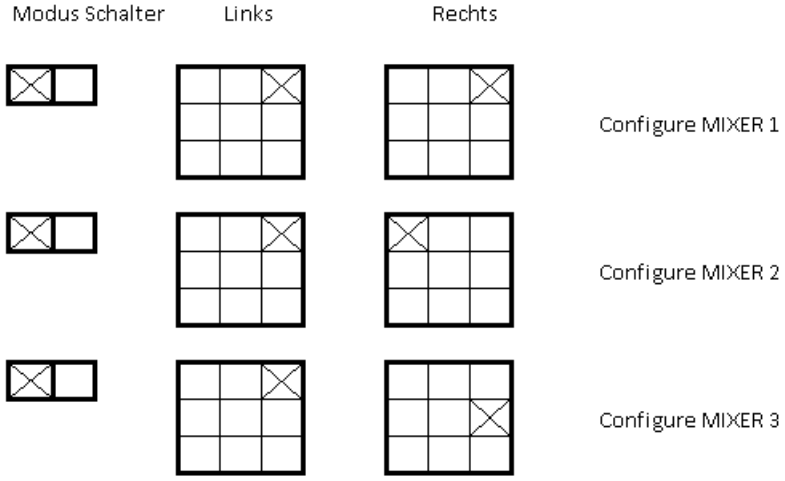
Use throttle stick or plus / minus buttons to enter the values.

See “entering values”

5.7 Configuration Options for Airplanes

5.7.1 Configure Mixers

The Range is -100% to +100%



You have to enter 6 values.

The first 3 values are for the NORM mode.

The next 3 values are for STUNT mode.

1. Mixer Input 1 % / NORM Modus
2. Mixer Input 2 % / NORM Modus
3. Mixer Input 3 % / NORM Modus
4. Mixer Input 1 % / STUNT Modus
5. Mixer Input 2 % / STUNT Modus
6. Mixer Input 3 % / STUNT Modus

Use throttle stick or plus / minus buttons to enter the values.

See “entering values”

The Inputs of Mixer 1 to 3 are:

1 AILERON - Aileron/Roll Stick after applying Expo & Rate

2 ELEVATOR - Elevator/Nick Stick after applying Expo & Rate

4 RUDDER - Rudder/Tail Stick after applying Expo & Rate

5.7.2 Reset Model Configuration

You can reset the model configuration by selecting to model type again.

5.8 Example

5.8.1 Configure a new Helicopter Model

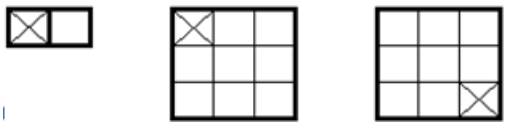
You want to configure a Helicopter model type on model memory 2.

The RF Mode shall be DSM2.

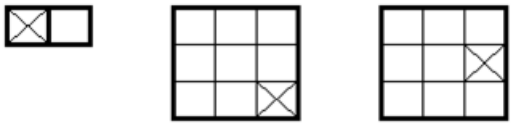
Gyro Gain may be about 40% in NORM and about 60% in Stunt Mode.

Follow these steps.

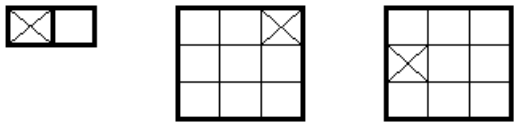
1. Move operation mode switch to the left (programming) position.
2. Turn on your Transmitter. You hear 2 beeps.
3. Move sticks to the following position (Model memory 2)



4. Push Set button. You hear a confirmation melody
5. Move sticks to the following position (DSM2)



6. Push Set button. You hear a confirmation melody
7. Move sticks to the following position



8.
9. Push Set button. You hear a confirmation melody
10. Move Throttle Stick to close below center (40%)
11. Push Set button.
12. Move Throttle Stick to close above center (60%)
13. Push Set button.
14. You hear a confirmation melody to indicate to indicate that gyro gain configuration is done.

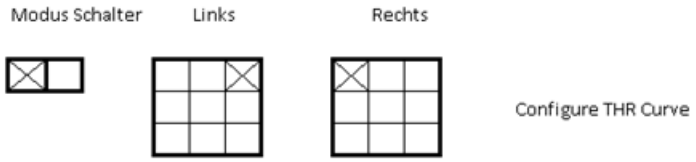
15. Push store button to store your changes.
16. Move operation mode switch to the right position (normal mode)
17. Test your changes

5.8.2 Increase center position of Throttle curve by 5%

We assume that programming while running is on.

Follow these steps:

1. Move the throttle Stick to the lower position.
2. Move mode switch to the left (programming) position.
3. You hear 2 beeps.
4. Move sticks to the following Position



5. Push Set button
6. We don’t want to change the first setting.
   For that push the next button.
7. Push 2 times the Plus button to increase the value by 2 x 2.5%.
8. Push Next
9. We don’t want to change 4 values.
   Push 4 times the Next value.
10. You hear a confirmation melody to indicate to indicate that throttle curve configuration is done.
11. Push the store button to save your changes.
12. Move mode switch back to normal.

5.9 Testing configuration changes

If the option “programming mode enable while running” is on, you can test your changes before saving them.

- Switch to programming mode
- Make your changes
- Do not push the save button
- Turn off programming mode
- The LED is flashing to indicate you have unchanged changes.
- Test your configuration
- If required switch to programming mode again and make further changes.
- When you are happy with the configuration. Switch to programming mode and push the save button to save your changes.

- Switch back to normal mode.

5.10 Default Settings

Transmitter:

Stick Input: Mode 2

Model memory: #1

Option “programming while running”: On

Option “fast model select”: On

Model:

Type: Classic

RF-Mode: DSMX

Trim: 0,0,0,0

Classic:

Count Down Timer: 3 Minutes

Gyro Gain: NORM -100
STUNT +100

Expo: 0%

Rate: 100%

Helicopter:

Count Down Timer: 3 Minutes

Gyro Gain: NORM 0
STUNT 0

Expo:	Roll	Nick	Tail
NORM	30%	30%	15%
STUNT	30%	30%	15%

Rate:	Roll	Nick	Tail
NORM	65%	65%	75%
STUNT	75%	75%	95%

Pitch Curve:	Min	Mid	Max
NORM	-30%	0%	+80%
STUNT	-90%	0%	+90%

Thr Curve:	Min	Mid	Max
NORM	-100%	0%	+90%
STUNT	90%	90%	+90%

Airplane:

Count Down Timer: 5 Minutes

Gyro Gain: NORM 0

STUNT 0

Expo:	Aileron	Elevator	Rudder
NORM	30%	30%	15%
STUNT	30%	30%	15%

Rate:	Aileron	Elevator	Rudder
NORM	30%	30%	15%
STUNT	30%	30%	15%

Mixer1:	Aileron	Elevator	Rudder
NORM	100%	0%	0%
STUNT	100%	0%	0%

Mixer2:	Aileron	Elevator	Rudder
NORM	0%	100%	0%
STUNT	0%	100%	0%

Mixer3:	Aileron	Elevator	Rudder
NORM	-100%	0%	0%
STUNT	-100%	0%	0%