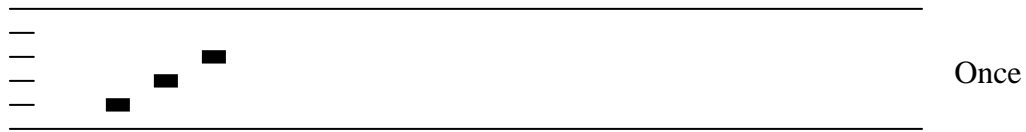# BLHeli: Normal operation

Power up:

Once

Throttle needs to be minimum before arming starts

Throttle up detected (arming sequence start):

Once

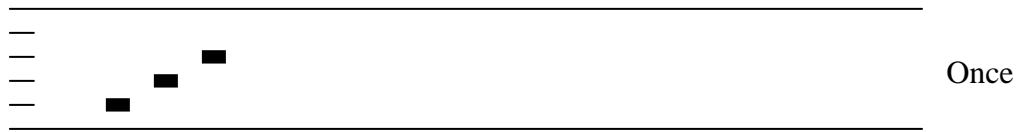The maximum throttle in this interval sets the"arm" target for the governor.

Zero throttle detected (arming sequence end):

Once

After this, the motor will run.

# BLHeli: Entering programming mode

Power up:

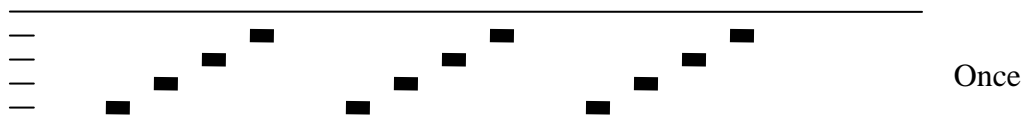Once

Throttle up detected (arming sequence start):

Once

Full throttle detected (start of entering programming mode):

Infinite

Zero throttle detected (continue entering programming mode):
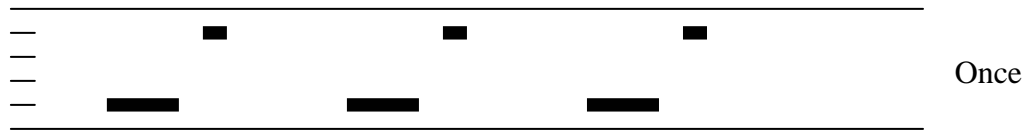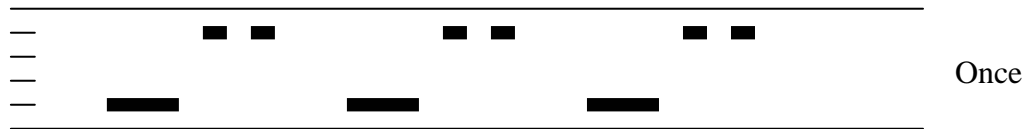
Infinite

Full throttle detected (programming mode entered):

Once

# BLHeli: Programming mode
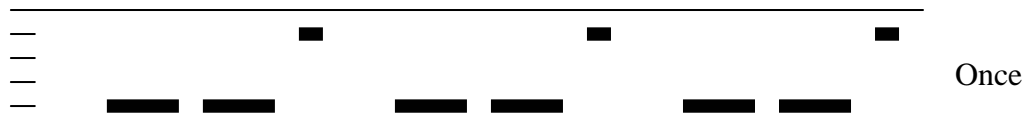
Function 1, parameter value 1

Once

Function 1, parameter value 2
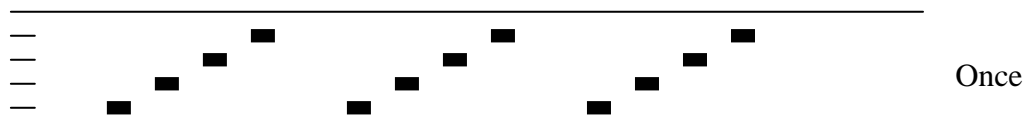
Once

…etc…

Function 2, parameter value 1

Once

…etc…

If the throttle stick is moved to zero during one of the above sequences, the parameter value of that function is selected and stored. And you will hear this sound:

Parameter value stored

Once

The ESC then resets itself.

If the throttle stick is never moved to zero, the ESC will reset itself after the last parameter value of the last function. Then no changes are done to the programmed values.

If power is disconnected during the programming sequence, then no changes are done to the programmed values.

# BLHeli: Programming functions and parameter values

Programming parameter value table main:

| Function | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 - Governor P gain | 0.38 | 0.50 | 0.75 | **1.00** | 1.50 |
| 2 - Governor I gain | 0.38 | 0.50 | 0.75 | **1.00** | 1.50 |
| 3 - Governor mode | **Tx** | Arm | Off | - | - |
| 4 - Startup power | 0.50 | 0.75 | **1.00** | 1.25 | 1.50 |
| 5 - Pwm frequency | **High** | Low | - | - | - |
| 6 - Input pwm polarity | **Positive** | Negative | - | - | - |

Programming parameter value table tail:

| Function | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 - Tail gain | 0.75 | 0.88 | **1.00** | 1.12 | 1.25 |
| 2 - Tail idle speed | Low | MediumLow | **Medium** | HediumHigh | High |
| 3 - Startup power | 0.50 | 0.75 | **1.00** | 1.25 | 1.50 |
| 4 - Pwm frequency | **High** | Low | - | - | - |
| 5 - Input pwm polarity | **Positive** | Negative | - | - | - |

Default values are marked in bold **green**.

In the governor "tx" mode, the throttle setting will set the speed target for the governor.
In this mode, the throttle curve when flying should be flat.

In the governor "arm" mode the maximum throttle seen during the arming sequence will set the speed target for the governor.
In this mode, the throttle curve when flying does not influence headspeed.
Throttle curve can be set for the desired main to tail mix (this mix is in the mCPX 3in1)

Governor P gain sets the proportional gain for the governor.
This setting controls the gain from speed error to motor power.

Governor I gain sets the integral gain for the governor.
This setting controls the gain from integrated speed error (summed over time) to motor power.

Tail gain scales the power applied to the tail motor for a given input.
Beware that a low tail gain will also limit the maximum power to the tail.

Tail idle speed is the speed of the tail motor during the delayed stop.

High pwm frequency is around 20-25kHz, and low pwm frequency is around 8-12kHz.
One benefit of using a low pwm frequency is that the step from almost full power to full power becomes smaller. On the other hand, 8kHz is in the audible frequency range.

If for some reason there is an error in the eeprom/flash write operation (e.g. due to loss of power or low voltage), defaults will be loaded.