FIRMTRONICS

WINGMAX

3-IN-1 ELEVON MIXER FOR FLYING WINGS & V-TAIL AIRCRAFT

SERVO MIXER / LOST MODEL ALARM / BATTERY INDICATOR

INTRODUCTION

WingMax is a multi-function elevon mixer, offering three useful functions in one compact device. The 3 functions include an elevon mixer for 'flying wings' and V-Tail aircraft, a lost model alarm and an audible receiver battery voltage indicator, with in-flight low battery warning and low battery alarm. WingMax also has programmable variable throw which allows each channel to be independently set up with either 50% or 100% servo throw.

FEATURES

- Elevon and V-Tail mixer (for 'flying wings' and V-Tail aircraft).
- Programmable servo travel (50% or 100%).
- Lost model alarm with transmitter interference detection.
- Receiver battery voltage indicator on power-on.
- Low battery warning during flight – activates at 4.2V.
- Low battery alarm during flight – activates at 4.0V.
- Calibrate feature detects centre position for better symmetry.
- Uses a powerful RISC processor.
- Smooth servo travel.
- Settings retained during power-off.
- Low power consumption (alarm sounds for 2 days on fully charged battery).
- Extremely compact and lightweight.

TECHNICAL INFORMATION

ELECTRICAL & PHYSICAL SPECIFICATIONS	
Operating Voltage	2.7 V to 6.0 V
Operating Temperature	-20°C to 80°C
Current Consumption - alarm inactive	4.75 mA
Weight	6 g
Module Size	30 x 12 x 12 mm
Low Battery Warning Threshold	4.2 V
Low Battery Alarm Threshold	4.0 V

POWER-ON BEEP CODES	
BEEP CODE	BATTERY VOLTAGE
5 Short Beeps	Above 4.8V
4 Short Beeps	4.6V – 4.8V
3 Short Beeps	4.4V – 4.6V
2 Short Beeps	4.2V – 4.4V
1 Short Beep	4.0V – 4.2V
1 Long Beep	Below 4.0V

NOTE: ***Supplying more than 6 volts to the device could cause permanent damage. Please only use 4 cell battery packs.***

CONNECTIONS

Figure 2 shows WingMax's output connectors. Connect Futaba compatible servos to these connectors and plug WingMax into the appropriate channels on the receiver.

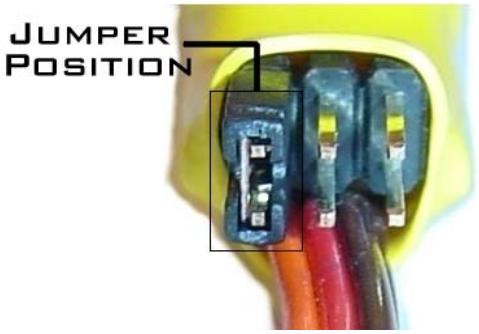

Figure 1. Jumper Position for Calibration

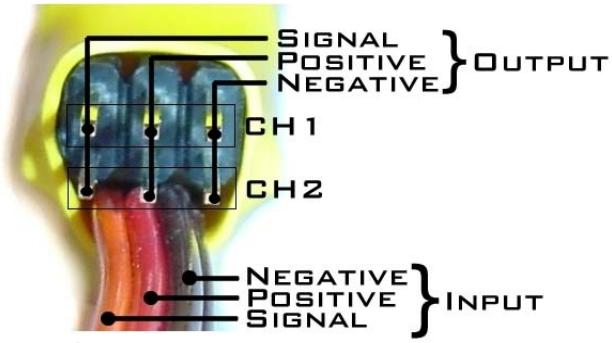

Figure 2. Output connectors

Calibration (Recommended)

To get the best performance, it is strongly recommended that WingMax be calibrated. Since every transmitter is different, WingMax needs to be 'fine tuned' to the particular radio being used, giving greater symmetry in the output signals to the servos and hence better control.

1. Power-off the receiver and transmitter.
2. Connect WingMax to the 2 channels intended for use on the receiver.
3. Remove any servos connected to WingMax's output pins and connect the jumper across WingMax's output signal pins on channel 1 and channel 2 (see Figure 1).
4. Power-on the transmitter, making sure the trims and the control sticks are in the centre position.
5. Power-on the receiver and WingMax will beep for 1 second, during which time the transmitter's control sticks or trim tabs must not be moved.
6. Power-off the receiver and then the transmitter.
7. WingMax has now been calibrated. Remove the jumper and proceed with "*Installation*".

Programming Variable Servo Throw

This feature may be used if the amount of servo travel needs to be adjusted to prevent servo stall or to adjust sensitivity. Follow steps 1–5 (inclusive) as described in the "*Calibration*" section of this user guide and then do the following:

- Move the appropriate transmitter stick in the direction that produces 2 beeps (indicating 50% travel) or a single beep (indicating 100% travel).
- When the required 50% or 100% beep code is heard (by moving the control stick one way or the other), return the stick to centre position and continue with step 6 in the "*Calibration*" section of this user guide.

Installation

For both elevon ('flying wings') and V-Tail use, WingMax will need to be set up so that both control surfaces move in the same direction when the elevator stick on your transmitter is moved and in opposite directions when the aileron stick (or rudder stick for V-Tail aircraft) is moved. The following instructions are common to both elevon mixing and V-Tail mixing:

1. Plug in WingMax into the receiver and connect the servos to WingMax's output pins (see Figure 2).
2. Power-on your equipment and move the elevator stick on the transmitter and make sure the control surfaces move in the same direction (it doesn't matter which direction for now). If they don't, swap WingMax's input leads plugged into the receiver (not the servo leads connected to WingMax's output pins!).
3. Now make sure the control surfaces both move up when the elevator stick on the transmitter moves down. If movement is reversed, either swap the servo leads connected to WingMax's output pins or activate the reverse switch on the transmitter (don't do both!). Please note, moving the elevator stick down is actually up elevator (aircraft climbs). Conversely, moving the elevator stick up is down elevator (aircraft descends) – just like a joystick in a full-size aircraft.
4. **Elevon Mixing**: When the aileron stick on the transmitter is moved to the right, the right control surface should move up and the left control surface down, as viewed from the rear of the aircraft. **V-Tail Mixing:** When the rudder stick on the transmitter is moved to the right, the left control surface should move up and the right control surface down, as viewed from the rear of the aircraft. **Note**: The reverse switch on the transmitter will need to be activated if the movement is reversed.

Operation

When WingMax receives a valid signal from the receiver, it will perform mixing and provide the mixed signal to the servos. In the event of a loss of signal, WingMax will sound a Lost Model Alarm (LMA) every 3 seconds. The LMA is distinctive from any other alarm and can be heard by turning off the transmitter. During operation, when the receiver battery voltage falls below 4.2V, the Low Battery Warning (3 short beeps) will sound every 10 seconds. When the receiver battery voltage falls below 4.0V, the Low Battery Alarm (3 short beeps) will sound every 1.5 seconds. Land immediately when the Low Battery Alarm sounds.