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# TBS TANGO 2 Radio

Revision 2020-01-22

*Compact all-in-one Remote Control Radio with TBS Crossfire System*



The TBS TANGO 2 remote control is an all-in-one system made for R/C enthusiasts. It features a built-in TBS Crossfire MicroTX radio module. Input controls are provided by full-size hall gimbals. A bright display shows the radio status and telemetry.

## Key features

- Compact and ergonomic All-in-one (AIO) radio
- Integrated TBS CROSSFIRE MicroTX - up to 250mW
- Runs TBS FreedomTX, a temporary OpenTX fork
- Industry's lowest latency - only achievable with an AIO solution!
- Travel and beginner friendly
- Full-size digital hall gimbals
- Unconventional low-profile switches for transportability, reliability and durability
- Foldable antenna - also doubles as a kickstand
- TBS CLOUD ready (future proof)
- Digital trim buttons (compatible with traditional R/C aircraft)
- Solid build with quality components



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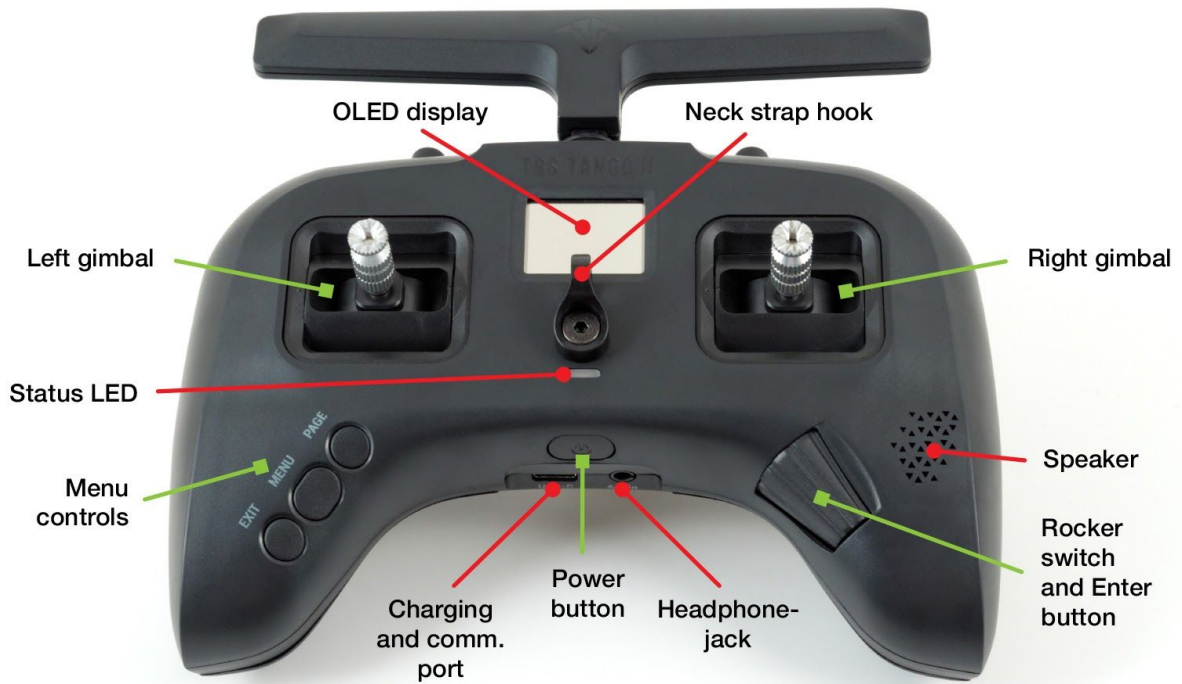
## Specifications

<b>Type:</b>	All-in-one (AIO) integrated radio
<b>RC system:</b>	Built-in TBS CROSSFIRE MicroTX
<b>Output power:</b>	25mW to 250mW
<b>Frequency Bands:</b>	868MHz (EU, Russia), 915MHz (USA, Asia, Australia)
<b>Antenna:</b>	Standard full-size TX antenna Switchable antenna polarization - horizontal / vertical Optional external SMA port
<b>Holding style:</b>	Pinch, thumb, and hybrid friendly
<b>Default stick mode:</b>	Mode 2, throttle and yaw left (user-changeable)
<b>Display:</b>	High-resolution 1.2" OLED-panel, 128 x 96 pixels
<b>Models:</b>	Standard and Pro model. PRO model has folding gimbals
<b>Battery:</b>	Lithium-polymer 3.7V 5000mAh internal battery pack, USB-C charging
<b>Runtime:</b>	Approx. 8 hours
<b>Channels:</b>	8- or 12-channels
<b>Operating range:</b>	Variable depending on output power and radio environment
<b>Gimbals</b>	Full-size hall sensor gimbals, Adjustable vertical range, Adjustable spring tension, Foldable sticks (PRO version only)
<b>Controls:</b>	2x Quad full-size hall gimbals 2x Two-position switches 2x Three-position switches 2x Lower-shoulder momentary buttons 3x Configuration buttons 1x Rocker switch 1x Power-on button
<b>Ports:</b>	3.5mm headphone audio-jack for OpenTX voice support USB-C for software updates and charging
<b>Neck-strap mounting:</b>	Screw on mount - sold separately
<b>Speaker:</b>	1W, for OpenTx voice support
<b>Simulator compatibility:</b>	Yes, over USB-C
<b>Working temperature:</b>	0 - 40°C
<b>Size:</b>	W 157 x L130 x H70 mm (H50 mm folded)
<b>Weight:</b>	345 grams
<b>Kit contents:</b>	1x TBS TANGO 2 Radio Controller, 1x External SMA antenna kit, 1x Soft gimbal springs



# Overview

The following diagrams indicates the essential input controls (green) and features (red) of the radio.



## Detailed overview



Power button, status LED, neck-strap hook and OLED display



Left gimbal and configuration menu buttons



Radio control buttons



Rocker switch, power button, ports and speaker



Left two-position (A/L1) and three-position (B/L2) switch



Right two-position (D/R1) switch and three-position (C/R2) switch





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## Getting ready

Getting set up and ready to fly is a quick and simple task. In most cases plug&play when using TBS equipment.

### Power up

Press and hold the Power-button for three seconds until the animation completes. The TBS TANGO II screen will welcome you and the power button lights up yellow.

### USB Joystick

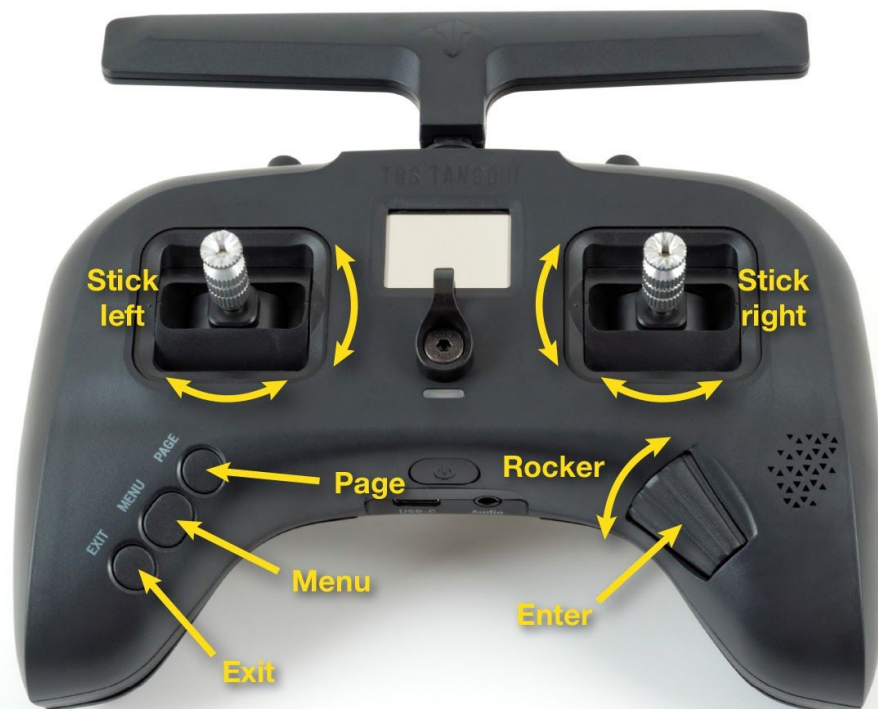
Plug-in a USB-C cable and a menu will appear where you can activate USB joystick mode. This mode will work with the most common simulators available.



## Configuration controls

To navigate and configure the radio, the left-side buttons and right-side selector wheel are used. These are the control inputs for the configuration menu system:

- **Menu**
  - Quick-press enters the model setup. First page is the TBS CROSSFIRE configuration (LUA)
  - Long-press enters the radio configuration
- **Page**
  - Quick-press skips through the different configuration views
  - Long-press enters the telemetry view
- **Exit**
  - Go backwards or exit the configuration menus
- **Enter**
  - Single-press engages a configuration menu item
  - Double-press enters stick trim menu
- **Rocker**
  - Scroll through the available menu items or setting options





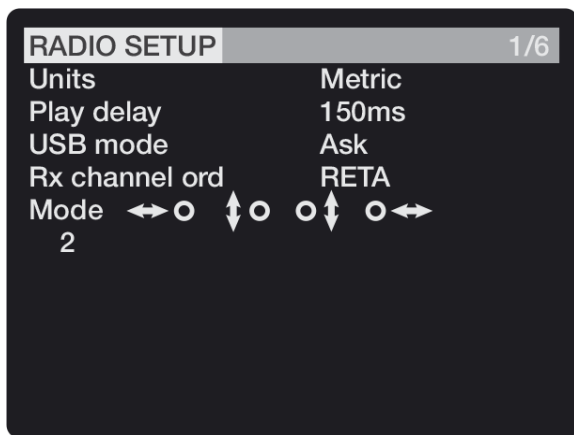
## Setup

The radio comes ready to go. Simply bind (push MENU, enter Crossfire TX folder, and select the BIND command) to your favorite model and you're ready to fly. However, if you are not a Mode 2 (throttle left) pilot, you will need to make some changes.

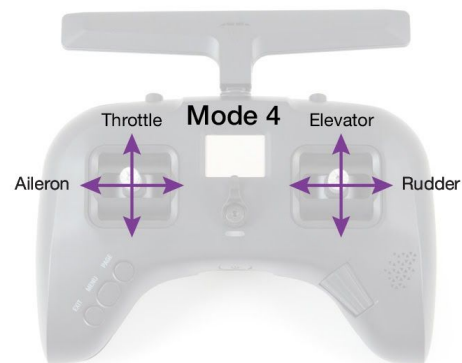
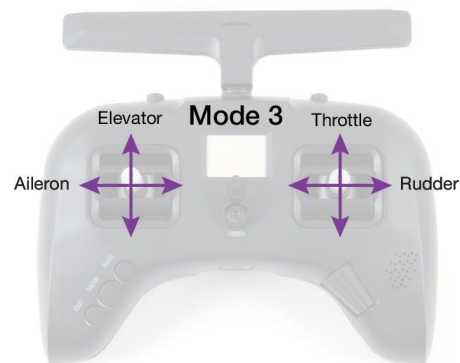
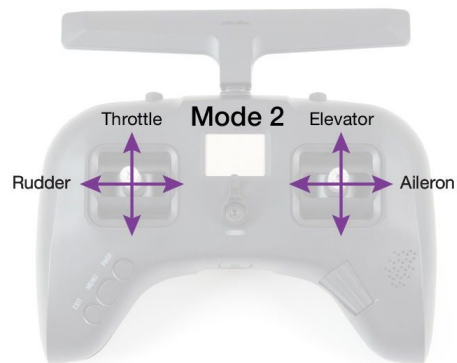
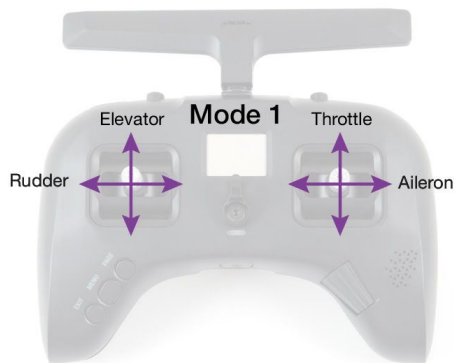
### Changing stick mode

When talking about stick modes we are referring to how the remote is configured to control the aircraft i.e. which sticks operate which controls on the aircraft. You can swap the stick gimbals by opening up the remote, covered later on in the manual.

By default the remote is set up with Mode 2, which is the most common type used.



1. Long-press the Menu-button to enter the Radio Setup
2. Scroll down to the end using the Rocker-switch
3. Change the Mode to the desired type
4. Follow the instructions later in the manual to change the throttle to the other side, if required



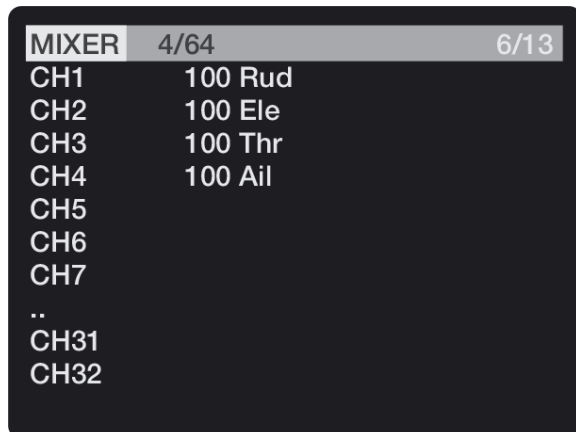
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## Changing channel mixing and end-points

For detailed channel mixing, rates, and end-point settings, it is recommended to set up these on the flight controller side (CleanFlight, BetaFlight, RaceFlight, APM, PX4, Pixhawk, etc.), for anything else than flying wings.

### Flying Wings

The TBS TANGO supports channel mixing for flying wings (normal and V-tail). The mixing, end-point, and reverse settings can be configured in the "Advanced" menu, after you have set up your new flying wing model.



MIXER	4/64	6/13
CH1	100 Rud	
CH2	100 Ele	
CH3	100 Thr	
CH4	100 Ail	
CH5		
CH6		
CH7		
..		
CH31		
CH32		

1. Quick-press the Menu-button to enter the Model Setup
2. Change to the Mixer screen by pressing the Page-button
3. Use the Rocker and Enter-switch to select a channel

More information can be found in relevant online tutorials explaining the operating and mixing principles of OpenTX

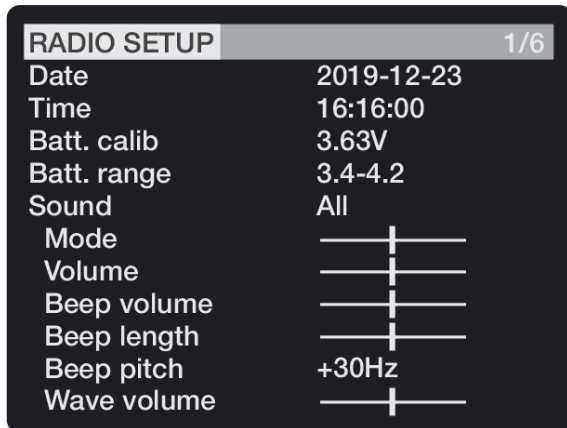


## Radio configuration menu

Changing settings on the TBS TANGO 2 is done using the OLED display and controlled using the Rocker-switch/Enter-button. **Long-press the Menu-button** to enter the radio configuration menu.



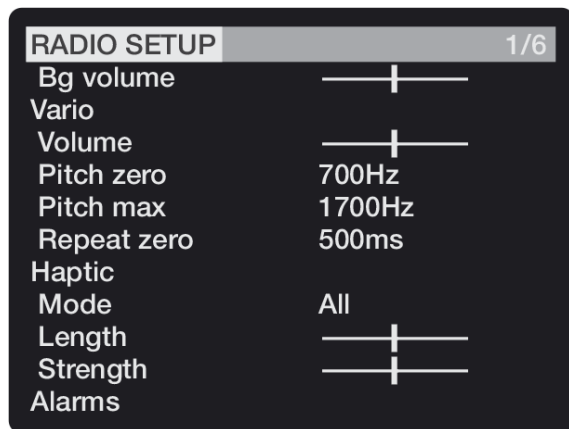
## Radio setup



Configures the major features of the radio

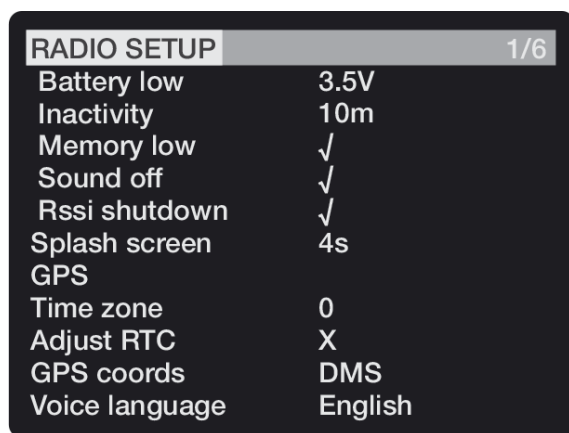
- **Date** - Current date
- **Time** - Current time, no timezone or daylight
- **Battery calibration** - Use a multimeter to measure an input the voltage here
- **Battery range** - Span of the graphical radio battery meter on the main views, must be 3.4 to 4.2V for TANGO II
- **Sound** - Mode, Master volume, individual volumes of all mixed sources (Beeps, sound files, variometer, background music), beep duration and pitch





Continuation of radio setup

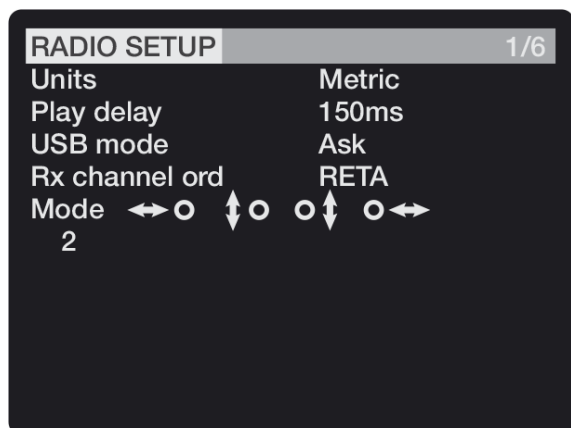
- **Vario** - Generates the tone/sound of a glider variometer, uses altitude or vertical speed telemetry data
- **Haptic** - For physical tactile feedback, not applicable to TANGO II



Continue of radio setup

- **Alarms** - Audible alarms
  - **Battery low** - Beep when battery reaches this threshold
  - **Inactivity** - Reminder if you have forgotten to turn the radio off
  - **Memory low** - Be notified when the SD-card runs low on memory
  - **Sound off** - If the alarms inadvertently have been turned off
  - **RSSI shutdown** - Warning is announced when the radio is being shutdown with a receiver on and connected
- **Splash screen** - How long to display the start-up screen
- **GPS** - Not applicable to TANGO II
- **Time zone** - specifies Universal Time Coordinated (UTC) offset for local longitudinal time zone
- **Adjust RTC** - Correct built-in real-time clock, not applicable to TANGO II
- **GPS coords** - GPS format, not applicable for TANGO II
- **Voice language** - Which audible package to use for alerts

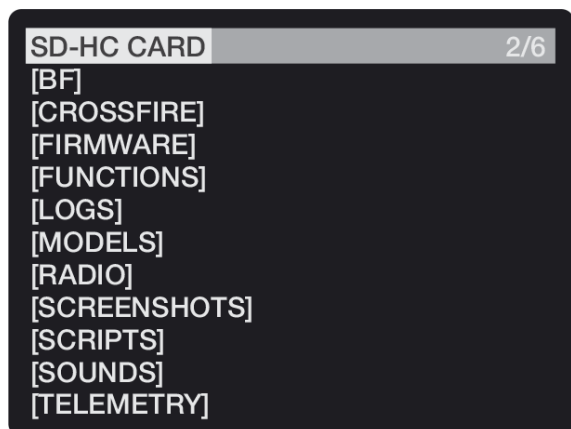




Continuation of radio setup

- **Units** - Metric and imperial units for telemetry values
- **Play delay** - Delays playing sounds associated with the mid-position of 3-position switches
- **USB mode** - Set which mode to use when USB-C cable is connected
- **Rx channel order** - Determines the order in which the four primary controls (Rudder, Elevator, Aileron, and Throttle) are inserted on channels 1-4 when creating a new model
- **Mode** - Determines which sticks move which controls on the airplane

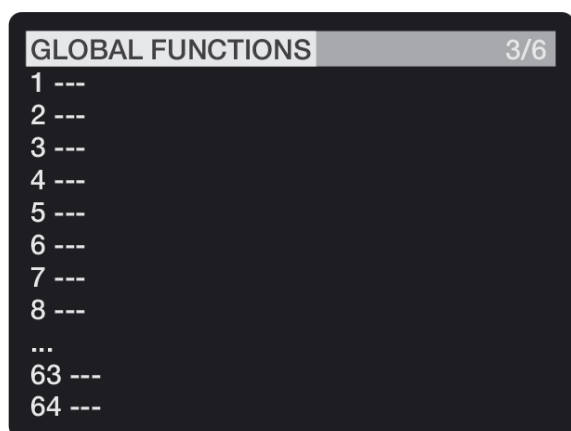
## Memory card



Browse and look up the contents of the SD-card

- Use the **Rocker-wheel** and **Enter-button** to browse
- You can update the SD card contents by connecting the USB and selecting the SD card operation mode. The SD card will be recognized as PC drive. For the latest SD card contents, visit the OpenTX website.

## Global functions



This is the place where switches can be used to trigger special functions such as trainer mode, soundtrack playback, speech output of variables etc.

- Global functions are special functions that are applied across all planes.



## Hardware

```
HARDWARE 4/6
Sticks [CALIBRATION]
Rud ---
Ele ---
Thr ---
Ail ---
Pots
P1 None
P2 None
Switches
SA --- Toggle
SB --- 3POS
```

Configure all the installed input sticks, switches and buttons

- **Sticks** - Perform the calibration of the hall-effect magnetic gimbals
- **Pots** - Not applicable to TANGO II
- **Switches** - Sets the type of switches

```
HARDWARE 4/6
SC --- 3POS
SD --- Toggle
SE --- 2POS
SF --- 2POS
Batt. calib 3.64V
RTC Batt. 0.00V
Max. bauds 400000
ADC filter ✓
RAS ---/---
Debug [Anas][Keys]
```

- **Battery calibration** - Use a multimeter to measure and input the voltage
- **RTC battery** - Not applicable to TANGO II
- **Max. bauds** - Specify communication baud rate when in trainer or joystick mode
- **ADC filter** - Apply filter to the analog inputs
- **RAS** - Relative Antenna Status, not applicable to TANGO II
- **Debug** - FIXME

## Version

```
VERSION 5/6
FW : fdtx-tango
VERS : 1.0.0
DATE : 2019-11-29
TIME : 12:45:23
EEPR : 219
```

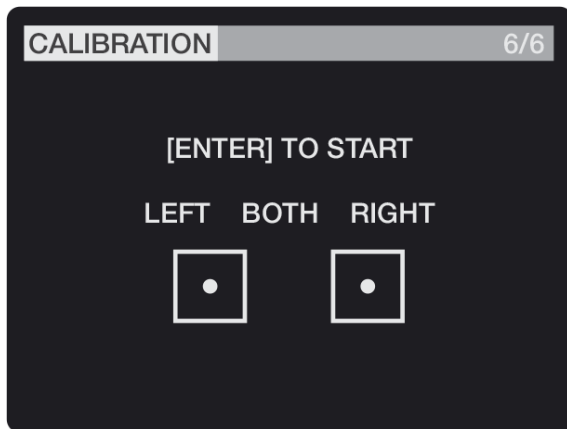
Current build and version of the OpenTX firmware

- As the TANGO II is branch of the OpenTX codebase it needs it specific build



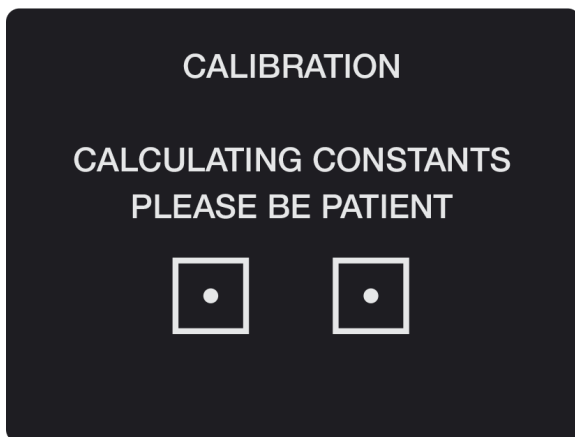
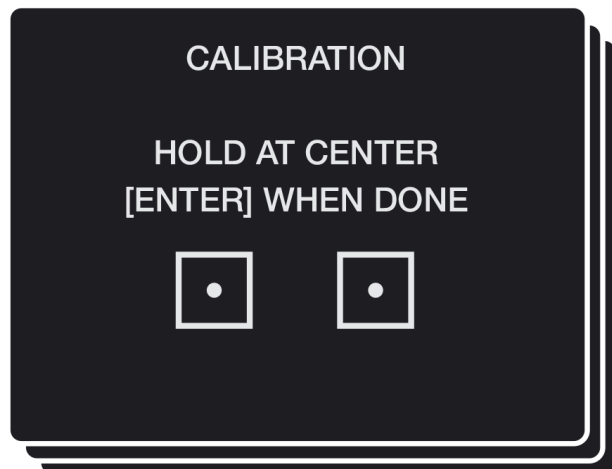
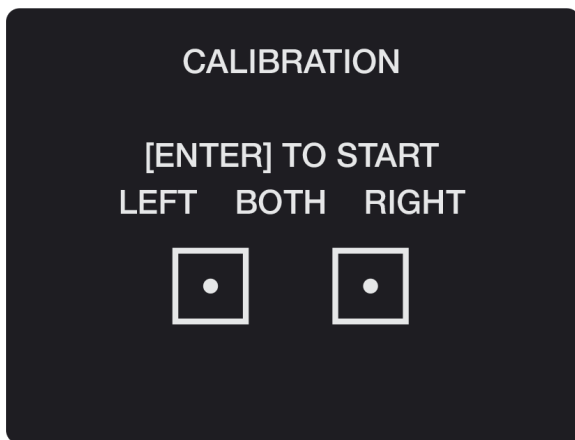


## Calibration



Re-perform the gimbal stick calibration

- If the initial calibration was incorrect, re-do it by pressing the Enter-button and follow the instructions
- **IMPORTANT:** on the final step, do NOT move the sticks to their combined extremes (e.g. top-left, top-right, bottom-left, bottom-right). Move the sticks to their individual extremes ONLY (top, bottom, left, right).

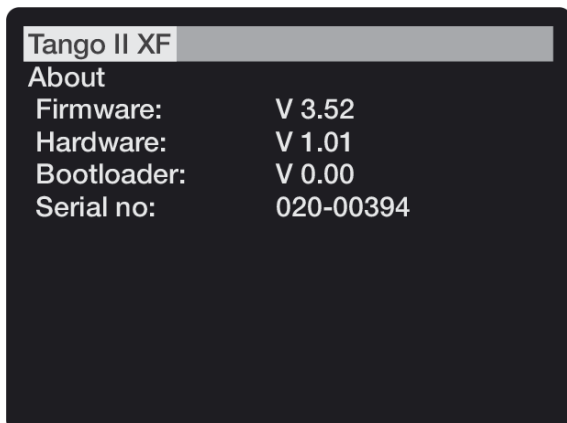
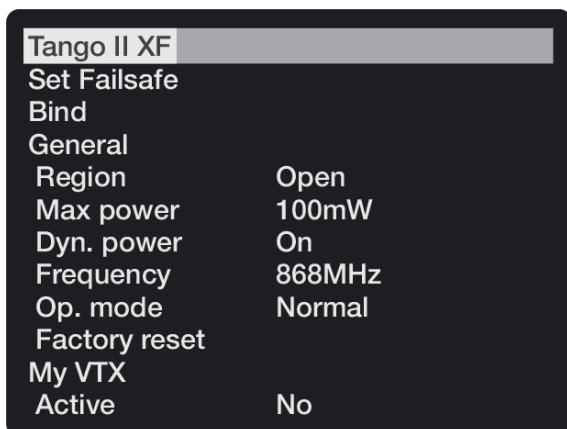
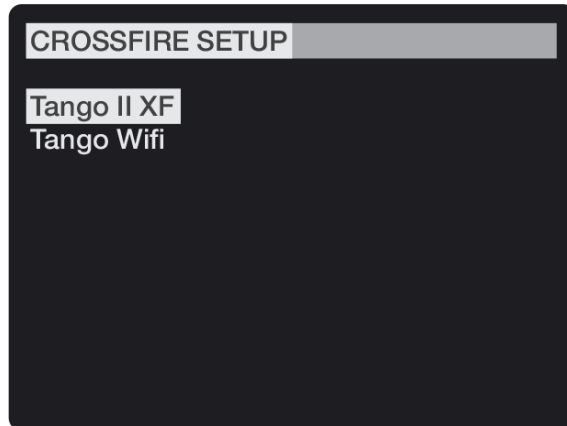
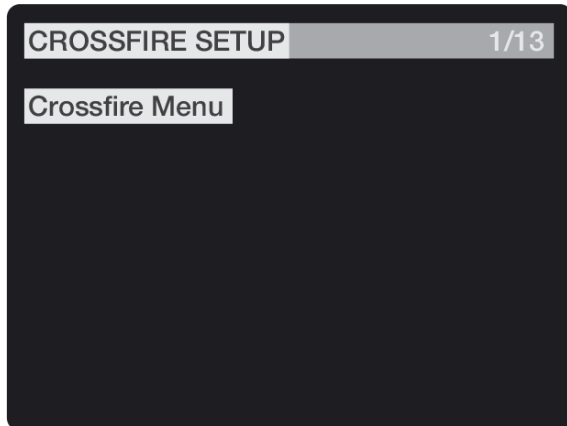


## Model configuration menu

All the model specific settings are accessible by pushing the MENU button. Here you configure the currently active model (name visible on the home screen). To change the active model, long-press ENTER and choose the "SELECT Model" view.

Enter the configuration menu by **quick-pressing the Menu-button**.

### TBS Crossfire menu



For those familiar with the TBS CROSSFIRE LUA script on OpenTX, this is the same menu.

CROSSFIRE configuration for TANGO II

- **Set failsafe** - Set defaults on signal loss
- **Bind** - Initialize the CROSSFIRE receiver binding procedure
- **General** - Operating parameters
  - **Region** - Select your region to set the right frequency band and power
  - **Max. power** - Manually adjust the max. RF power output
  - **Dynamic power** - Automatically adjust RF power output in accordance to received signal indicators
  - **Frequency** - Frequency band to use, 868MHz (Europe, Russia) or 915MHz (USA, Asia, Australia)
  - **Operation mode** - Normal (recommended) or Forced telemetry



## OpenTX configuration menu

Changing detailed OpenTX settings can be done in the main OpenTX configuration menu. **Quick-pressing the Menu-button** to enter the configuration menu and switch screens with the Page-button.



## OpenTX setup

SETUP		2/13
Model name	Model101	
Timer1	OFF	00:00
Name		
Persist.	OFF	
Minute	X	
Countdown	Silent	
Timer2	OFF	00:00
Name		
Persist.	OFF	
Minute	X	
Countdown	Silent	

SETUP		2/13
Timer3	OFF	00:00
Name		
Persist.	OFF	
Minute	X	
Countdown	Silent	
E.Limits	X	
E.Trims	X	[Reset]
Show Trims	No	
Trim Step	Fine	
Throttle		
T-Reverse	X	

Configures the general OpenTX features

- **Model name** - Specify profile name
- **Timer1/Timer2/Timer3** - Countdown timers
  - **Name** - Specify timer name
  - **Persistent** -
  - **Minute** - AA
  - **Countdown** - AA
- **Extended limits** - Allows servo travel past 100%
- **Extended trims** - Allows trims to cover the full stick range
- **Show trims** - Display trims on main screen
- **Trim step** - Graduality of trims
- **Throttle** - FIXME
- **T-Reverse** - Throttle direction reversed



SETUP		2/13
T-Source	Thr	
T-Trim	X	
Preflight	Checks	
Checklist	X	
T-Warning	√	
S-Warning	B↑C↑E↑F↑	
Ctr beep	RETA	
Glob.funcs	√	

- **T-Source** - Throttle input control source
- **T-Trim** - Throttle trim allowed
- **Preflight** - Trigger alert when the following checks fail
  - **Checklist** - Display contents of text file
  - **T-Warning** - Throttle high warning
  - **S-Warning** - Defined switch state warning
- **Center beep** - Beep when passing the center position of the sticks
- **Global functions** - Use global functions

## Radio setup

HELI SETUP		3/13
Swash Type	---	
Swash Ring	0	
Long. cyc.	---	
Weight	0	
Lateral cyc.	---	
Weight	0	
Collective	---	
Weight	0	

Configures the helicopter CCPM head mixer

- **Swash type** - Swashplate type
- **Swash ring** - Limits the control authority
- **Longitudinal/lateral cyclic/collective** - Configure source of control

## Flight modes

FLIGHT MODES		4/13
FM0		0000
FM1	---	0000
FM2	---	0000
FM3	---	0000
FM4	---	0000
FM5	---	0000
FM6	---	0000
FM7	---	0000
FM8	---	0000

Create flight presets that can activate a particular attitude or characteristics of the model

- **FM0-FM8** - Flight mode slots
  - Each of the flight mode slots can be named, has a selectable activation switch (physical or logical), a trim selection array, and slow up/down parameters for smooth transitions between modes.



FLIGHT MODE	FM0	4/13
Mode name		
Trims	:0 :0 :0 :0	
Fade in	0.0	
Fade out	0.0	
Global variables		
G1	Own	0
G2	Own	0
G3	Own	0
..	..	..
G8	Own	0
G9	Own	0

Configure the selected flight mode

- **Mode name** - Identifiable name
- **Trims** - R, E, T, A when shown mean the mode has its own trim setting for that control
- **Fade in** - Smooth transition time in-between mode change
- **Fade out** - Same delay for transition out
- **Global variables** - Commonly shared values
  - **G1-G9** - Specific configuration screens

## Inputs

INPUTS	4/64	5/13
Rud	100 Rud	---
Ele	100 Ele	---
Thr	100 Thr	---
Ail	100 Ail	---
05		
06		
07		
08		
..		
31		
32		

Allows setting one or more input formatting rules to each stick axis

- **Rud/Ele/Thr/Ail** - Specific input configuration screens

## Mixer

MIXER	4/64	6/13
CH1	100 Rud	
CH2	100 Ele	
CH3	100 Thr	
CH4	100 Ail	
CH5		
CH6		
CH7		
..		
CH31		
CH32		

This is where the actions on the controls will be mapped to servos

- **CH1-CH32** - Servo/output control channel, specific configuration screens

## Outputs



OUTPUTS	988us		7/13
CH1	0.0 -100	0.0 -100 > --- ^	
CH2	0.0 -100	0.0 -100 > --- ^	
CH3	0.0 -100	0.0 -100 > --- ^	
CH4	0.0 -100	0.0 -100 > --- ^	
CH5	0.0 -100	0.0 -100 > --- ^	
CH6	0.0 -100	0.0 -100 > --- ^	
CH7	0.0 -100	0.0 -100 > --- ^	
..	..	..	
CH31	0.0 -100	0.0 -100 > --- ^	
CH32	0.0 -100	0.0 -100 > --- ^	
Trims => Subtrims			

On the output screen each channel can be adapted to the mechanical characteristics of the model

- **CH1-CH32** - Servo/output control channel, specific configuration screens

## Curves

CURVES	8/13
CV1	
CV2	
CV3	
CV4	
CV5	
CV6	
CV7	
CV8	
..	
CV15	
CV16	

Custom curves can be used either in input formatting or mixers

- **CV1-CH16** - Curves, specific configuration screens

## Logical switches

LOGICAL SWITCHES	9/13
L01	
L02	
L03	
L04	
L05	
L06	
L07	
L09	
..	
L63	
L64	

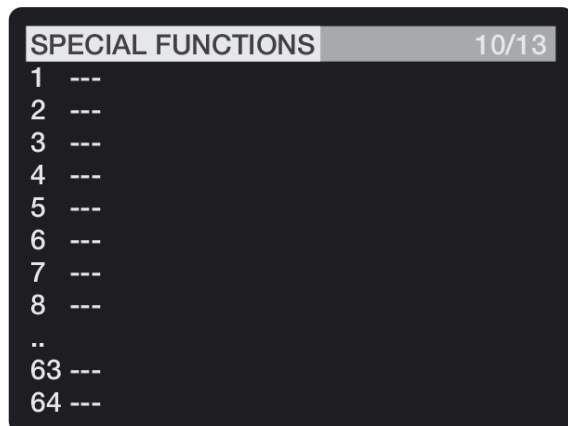
These are logic switches that are used to compare values and combine various conditions

- **L01-L64** - Logical switch, specific configuration screens





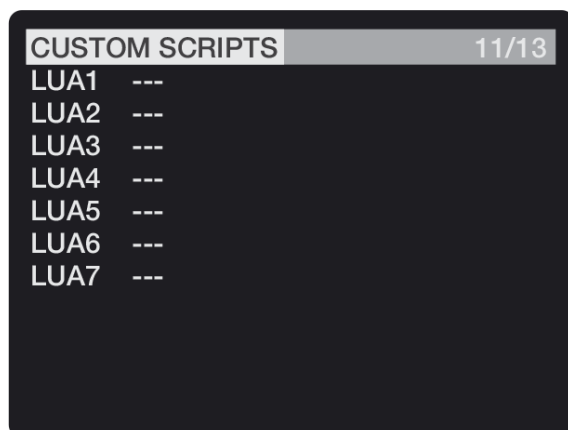
## Special functions



This is the place where switches can be used to trigger special functions such as trainer mode, soundtrack playback, speech output of variables etc.

- **1-64** - Special function, specific configuration screens

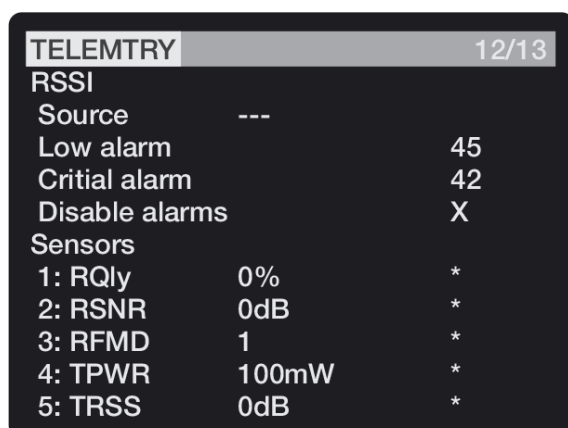
## Custom scripts



Select and configure Lua scripts and their inputs, these can be used to perform complex mixes

- **LUA1-LUA7** - LUA script, specific configuration screens

## Telemetry

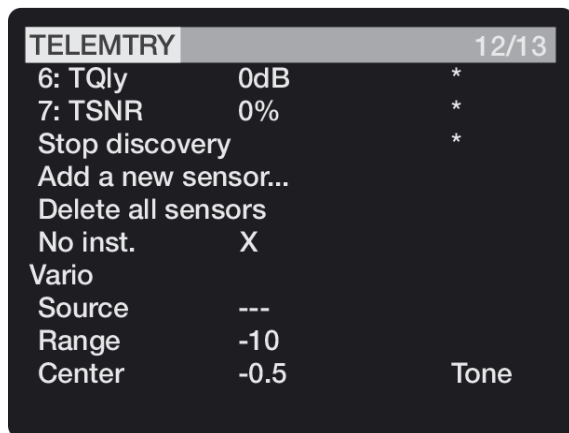


This groups all the basic telemetry-related settings.

- **RSSI** - Receiver Received Signal Strength Indicator
  - **Source** - Specify data source
  - **Low alarm** - Threshold low
  - **Critical alarm** - Threshold critical
  - **Disable alarms** - Inhibit alarms
- **Sensors** -
  - **RQly** - Receiver received uplink quality - the amount of the transmitted signal received by the receiver
  - **RSNR** - Uplink receiver signal-to-noise



- ratio
- **RFMD** - Uplink received frequency mode - to scale the 300% Crossfire LQ down to 3x 100%, 2 = 150Hz Mode, 1 = 50Hz Mode, 0 = 4Hz Mode (forced telemetry)
- **TPWR** - Downlink transmitter received telemetry power level
- **TRSS** - Downlink transmitter received telemetry RSSI



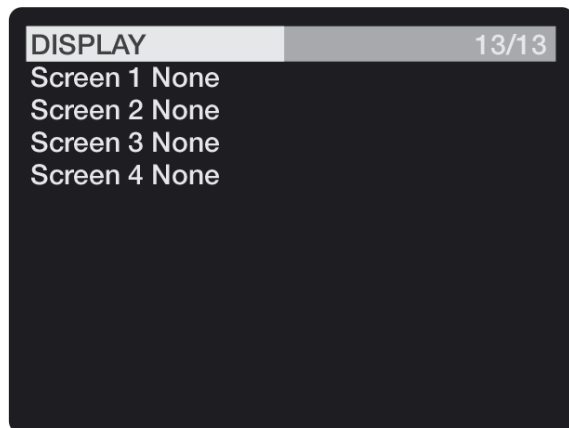
This groups all the basic telemetry-related settings.

- **TQly** - Transmitter received downlink quality - the amount of the transmitted signal received by the transmitter
- **TSNR** - Downlink transmitter signal-to-noise ratio
- **Stop discovery** - End sensor search
- **Add a new sensor** - Manually add sensor
- **Delete all sensors** - Remove all
- **No insta.** - FIXME
- **Vario** - Generates the tone/sound of a glider variometer
  - **Source** - Specify data source
  - **Range** - Usable signal range
  - **Center** - Equilibrium value



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## Display



The display screen is where the telemetry view screens are configured

- **Screen 1-4** - Specific telemetry values



## Usage

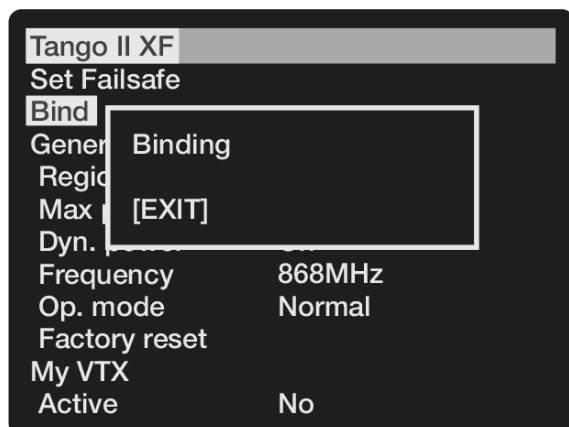
### Neck-strap

The optional neck-strap hooks into the center of the radio. It is made of metal, so it will last a life-time. You will need to purchase the neck-strap hook to attach to the radio, and then you can use a neckstrap of your choice. We recommend the ETHIX neck strap, which is available from TBS or your favorite FPV dealer.



### Bind

Connecting to a new CROSSFIRE receiver is simple and done via the CROSSFIRE menu.

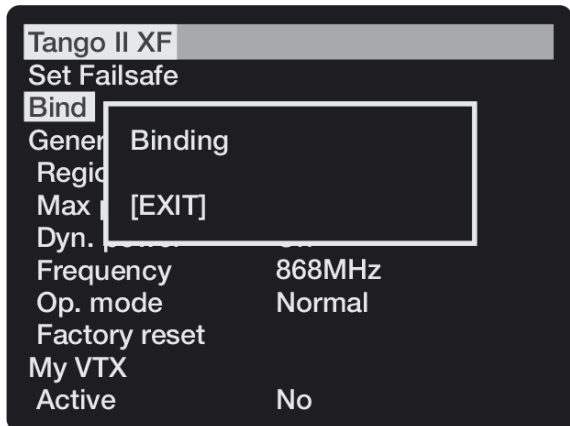


1. Press the Menu-button and select CROSSFIRE Menu, then select TANGO II XF
2. Connect power to the CROSSFIRE receiver and press the Bind-button on the unit
3. Select the Bind-menu item and wait for the binding process to complete

### Set failsafe





Configuring the CROSSFIRE failsafe state settings is done via the CROSSFIRE menu. Your model needs to be bound and running for the failsafe setting to work.



1. Press the Menu-button and select CROSSFIRE Menu, select TANGO II XF
2. Arrange the switches and sticks into the desired failsafe state
3. Select the Set failsafe-menu item and wait for the failsafe to be stored on the receiver

## Status indicator

When the remote is powered on, the LED behind the button will flash green. The built-in LiPo battery is charged every time a 5V power source is connected to the micro-USB connector.

Button LED indicator	Status
 Green blinking	Remote powered on
 Red	Battery is charging



## Stick trim

Adjusting the stick trim while in use is easy. Double-press the Rocket-switch/Enter-button, an audible feedback will sound and the corresponding stick direction will highlight on the display. Just the rocker-switch to adjust the trim. Double-press to change to a different stick direction. Press Exit when finished.



## Battery protection

The battery protection in the remote is based on nominal voltage, as follows:

Battery voltage	Condition
3.81V and over	Battery level 4, fully charged
3.71V	Battery level 3
3.61V	Battery level 2
3.41V	Battery level 1, beep tone and battery icon flashing
3.38V	Power on allowed, critical level, beep tone and battery icon flashing
3.34V	Shutdown voltage, 20 seconds countdown prompt, recharge as soon as possible





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## Alert prompts

The remote will raise an alert when one of the following events happen:

1. Battery low alert - described in the previous section
2. Telemetry data about the low RSSI, for RF module is set to XJT
3. Telemetry data about the low battery voltage, for RF module is set to XJT
4. Idle warn is activated and the timer is expired



## Inside the radio

To change the battery, stick mode, travel range, throttle ratchet, or gimbals, you will need to open up the remote control. Warranty will still intact, of course.

First remove the two rubber covers on the back-side by using a plastic spudger to lift the tabs out of the housing.

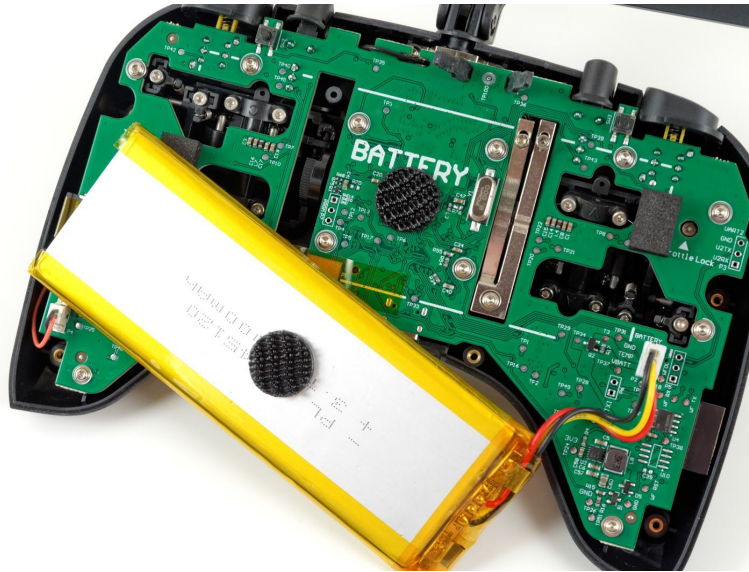


Then remove the six (6) screws, as indicated in the following photo with a M1.5 hex driver. Now, the back housing lifts off.



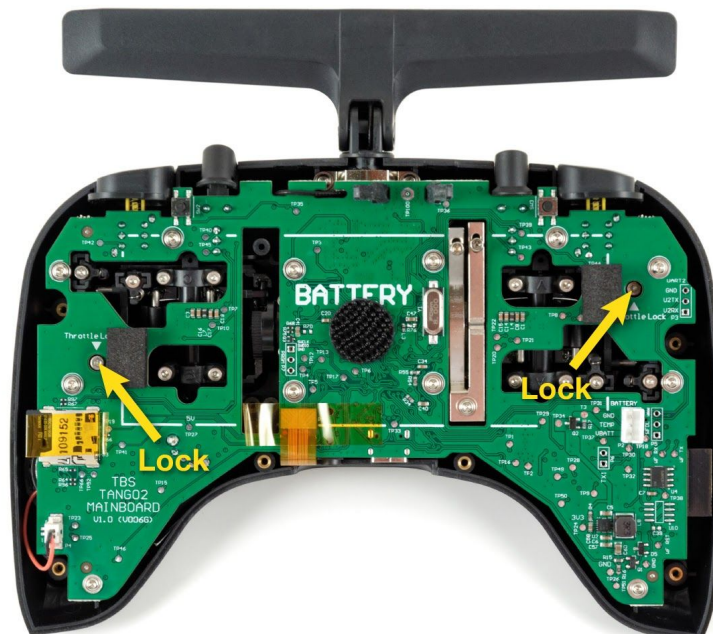
## Removing the battery

The battery is attached to the radio using a special hook & loop pad - making it easily removable to service the internals. It has a temperature sensor to keep it safe while in use and charging. If your battery is broken, you can get a replacement from TBS (or make a custom one) and install it directly in place of the original pack. The stock battery provide 5000mAh for approx. 8 hours of runtime.



## Changing the flight stick mode

Different flight modes will have the throttle on either the left- or right-side, requiring it to be non-sprung. Modifying it is a matter of screwing in the throttle-lock screw and loosening the other. Then moving the gimbal metal bracket to the side other side. The rest is changed in the radio configuration menu.

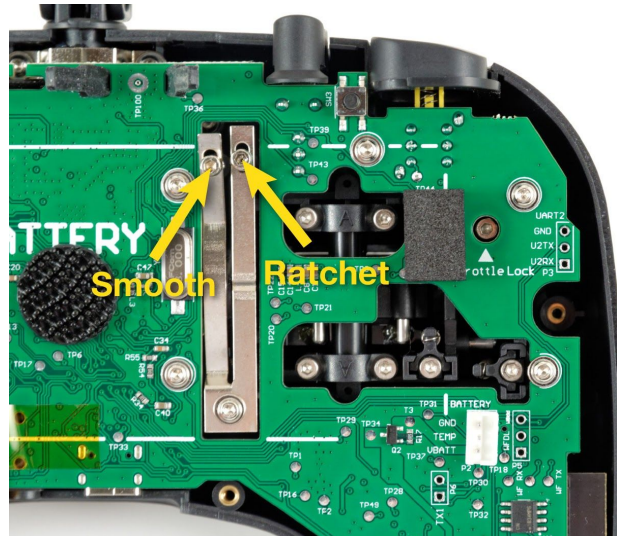


## Adjusting throttle ratchet strength

The radio comes with a smooth throttle from the factory. Adjusting how easy it moves can be adjusted by using a screwdriver and turning the left screw on the metal bracket, as shown in the following photo.

Counter-clockwise to decrease the tension and clockwise to increase the tension.

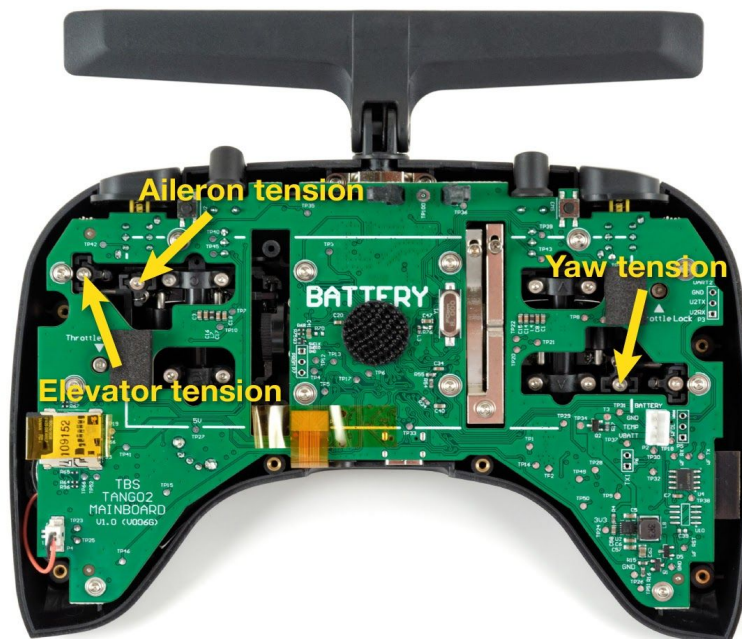
If you rather prefer a ratchet/clicking stick, loosen the left screw entirely and increase the tension of the right screw.



## Adjusting stick tension

If the sticks feel too rigid or too soft, the tension of the springs can be changed by adjusting the tensions screws. The locations are shown in the following photos.

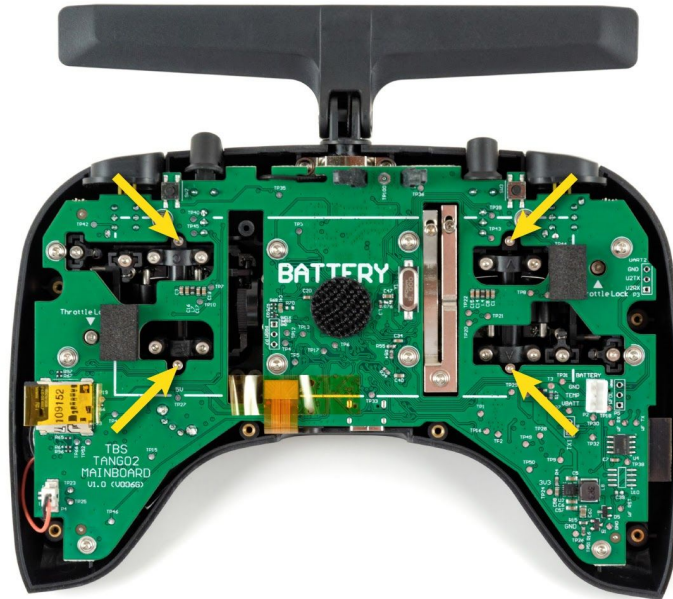
Turn counter-clockwise to increase the tension (more rigid), clockwise to decrease the tension (softer).





## Adjusting stick range

On the PRO-model, the range of motion of the elevator and throttle can be adjusted. The default is no limit. Adjust the screws shown in the following photo. Clockwise to increase the limit. There are 2x M1.4x6 machine thread screws included with every Tango 2 PRO. Recalibration is required after adjustment!



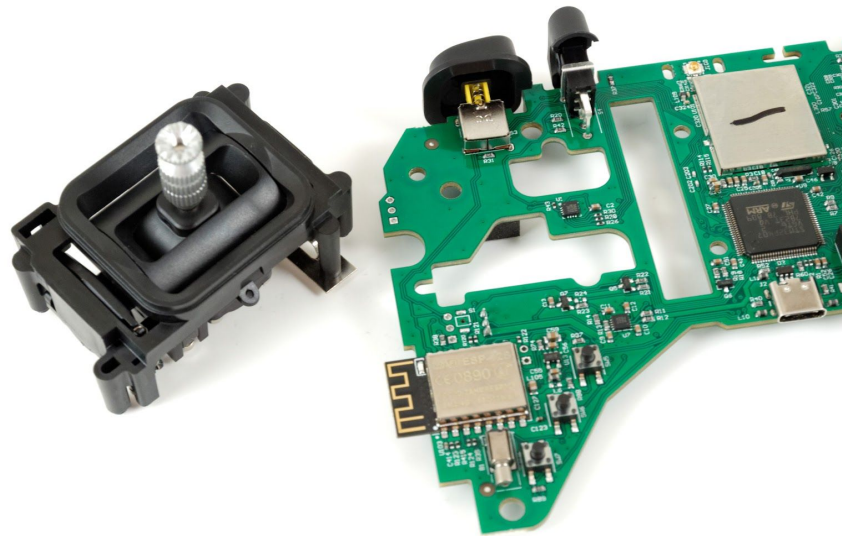
## Upgrading / changing the gimbals

Remove the thirteen (13) screws holding the mainboard to the housing and gimbals, disconnect the speaker cable battery, display flex-cable. It is also recommended to disconnect the antenna antenna rubber-strap and the u.FL connector to the antenna. Extra care is required if not disconnected!



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Lift the mainboard along with the gimbals out of the housing. The gimbal support pegs are inserted on the mainboard holes and easily pulls out. Insert the new gimbal(s) and re-assemble the radio. There are no electrical connections between the gimbal and the remote. Recalibration will be required after this step!



## Changing gimbal springs

The radio comes with a set of softer springs that provide less tension sticks. The difference from the stock springs is that these are approx. 20-30% less stiff, giving a smooth soft response.

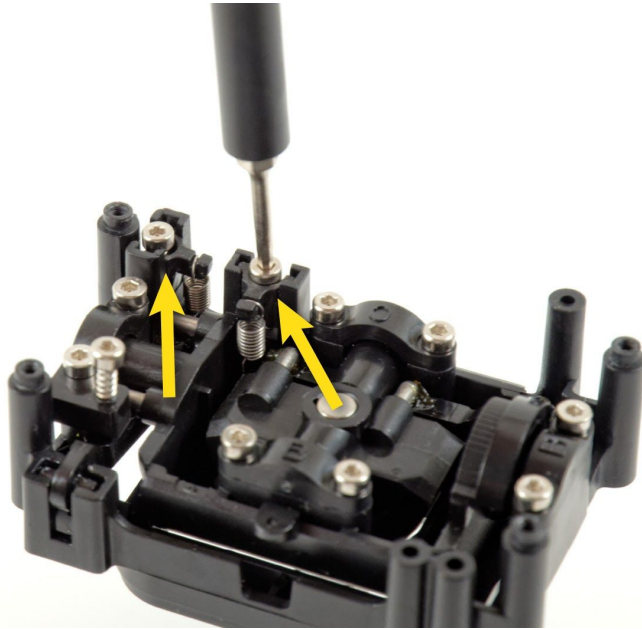


*Left: stock, right: soft*



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Remove the gimbals from the radio and unscrew the spring tension holder, as shown in the following photo. Unhook the stock springs and re-attach the new ones. This can be a bit tedious and only recommended for experienced users. A special trick is to first attach the springs to the lever, keeping tension on it with a tweezer, and then installing back the plastic holster and looping in the spring. This can be performed without removing the gimbals from the radio, but it is recommended to disassemble the radio for this step.



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## Swapping antenna type

The radio comes with a built-in antenna, but it can be changed to an external SMA connector so different antennas can be used. Remove the mainboard from the housing to expose the housing - be careful when unhooking the U.FL antenna connector, remove the rubber retainer first.

Unscrew the two screws holding the stock antenna in place, remove the antenna and metal bracket. Put the rubber retainer on the new connector and put the plastic adapter on the back of the SMA connector.

Screw the new SMA connector in place using the same screws and re-assemble the radio.



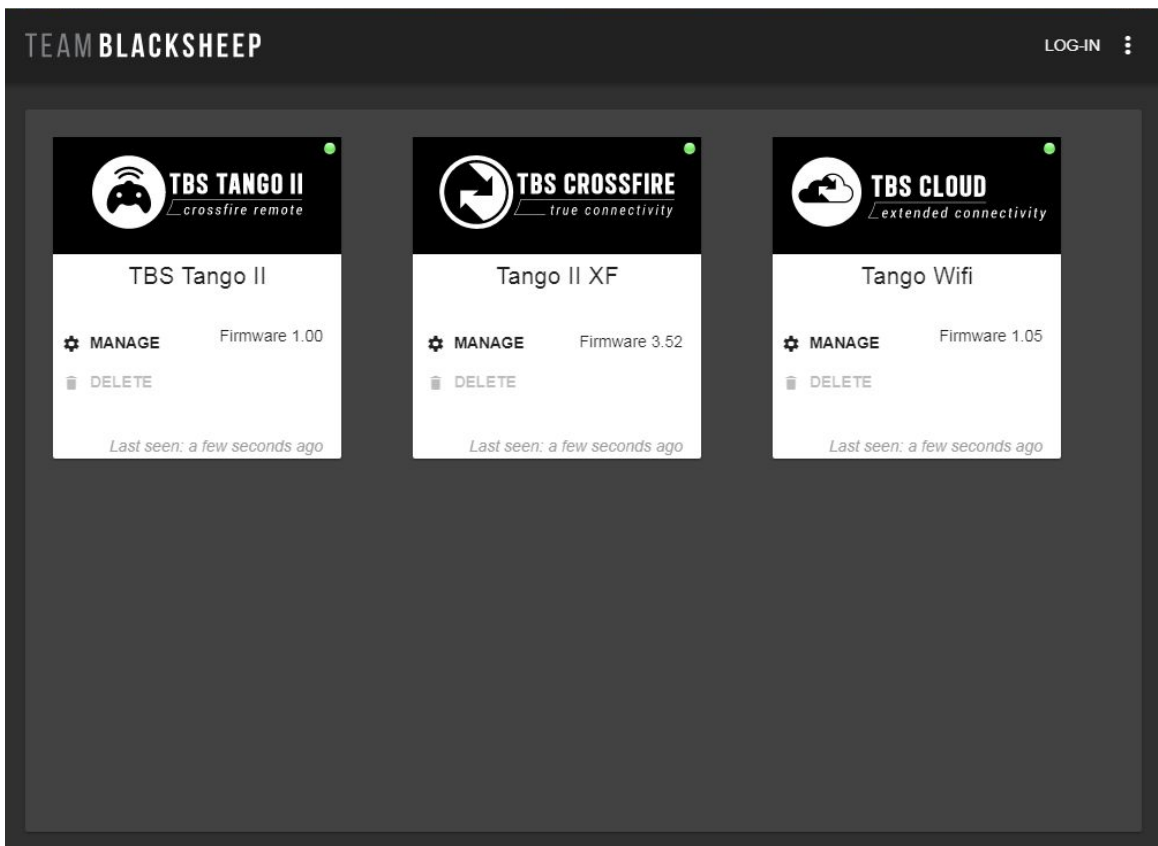
## Firmware upgrade

Updates to the remote is applied using our TBS AGENT software. This takes care of all the downloading of the latest firmware, verification- and upgrade process. Plug in the remote control, start the TBS Agent, and wait for the latest firmware to download. Then click on "UPDATE" to proceed.

### TBS Agent X

Download the installer from [team-blacksheep.com/products/prod:agentx](http://team-blacksheep.com/products/prod:agentx) (Windows7/8/10 and macOS) - no drivers needed to use the application, but an Internet connection is required to download the latest firmware versions. Press F1 if you like to include beta releases in the available updates.

Turn off the radio, plug in a USB-C cable on the radio. Power for the update is provided via USB. The software will automatically detect the device and offer you the option to upgrade the firmware if a newer version is available.



When the status indicator is green and says "Connected", you can upgrade or downgrade the firmware.

To upgrade the firmware, select the latest version from the drop-down menu and click Update. Rapid blinking indicates that the process is working and being updated. The process will take about 1 minute. Check all settings after the process is finished.



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## Attention

These Long Range Systems are capable to use radio frequency transmissions and output power that may be not allowed in your country. The radio will arrive locked to your country's regulations!

**Please always check your local RF legislation to set the frequency and output power according with the regulation.**

A general rule for RC aircrafts is that they must be controlled always under sight of view, check your RC regulation to keep up to date with regulations.

Manual written and designed by [ivc.no](http://ivc.no) in cooperation with TBS.

