

# **TX16S**

### **User Manual**

Version: 1.0

WWW.RADIOMASTERRC.COM



### Table of Contents

1. Overview	4
1.1. Introduction	4
1.2. Safety instructions	4
1.3. Manual and Firmware Download	5
1.4. Important !	5
1.5. Remote Control Overview	5
1.6. Power and charging precautions	6
1.7. Note	6
1.8. Specifications	7
1.9. Warranty and Repair	7
1.10. Firmware Update and OpenTX Information	8
1.11. Disclaimer	8
1.12. Legal status and copyright	8
2. OpenTX Companion software (OpenTX companion)	9
2.1. Software Download and Installation	9
2.2. Use Companion software to upgrade remote controller firmware	12
2.2. Ose companion software to apprade remote controller infinitie	
3. First boot	
	16
3. First boot	16 s as
3. First boot 3.1. Calibrate the battery voltage (take 2 3.7V 18650 lithium batteries in serie	16 s as 18
<ol> <li>First boot</li> <li>3.1. Calibrate the battery voltage (take 2 3.7V 18650 lithium batteries in serie an example)</li> </ol>	16 s as 18 20
<ul> <li>3. First boot</li> <li>3.1. Calibrate the battery voltage (take 2 3.7V 18650 lithium batteries in serie an example)</li></ul>	16 s as 18 20 22
<ul> <li>3. First boot</li> <li>3.1. Calibrate the battery voltage (take 2 3.7V 18650 lithium batteries in serie an example)</li></ul>	16 s as 18 20 22 23
<ul> <li>3. First boot</li></ul>	16 <b>s as</b> 18 20 22 23 23
<ul> <li>3. First boot</li></ul>	16 <b>s as</b> 18 20 22 23 23 23
<ul> <li>3. First boot</li></ul>	16 <b>s as</b> 18 20 22 23 23 23
<ul> <li>3. First boot</li></ul>	16 s as 18 20 22 23 23 23 24
<ul> <li>3. First boot</li></ul>	16 s as 18 20 22 23 23 23 24
<ul> <li>3. First boot</li></ul>	16 s as 18 20 22 23 23 24 24 24 25
<ul> <li>3. First boot</li></ul>	16 s as 18 20 22 23 23 23 24 24 24 24 24 26
<ul> <li>3. First boot.</li> <li>3.1. Calibrate the battery voltage (take 2 3.7V 18650 lithium batteries in serie an example).</li> <li>3.2. Calibrating Gimbals</li> <li>3.3. Set the default joystick mode and the default channel output order.</li> <li>4. Remote control menu details</li> <li>4.1. Main interface</li> <li>4.2. System settings.</li> <li>4.2.1 TOOLS (Tool page) description</li> <li>24</li> <li>4.2.2 SD CARD (SD Card Page) Instructions</li> <li>4.2.3 RADIO SETUP Instructions</li> <li>4.2.4 GLOBA FUNCTIONS (Global Functions Page) Instructions</li> </ul>	16 s as 18 20 22 23 23 23 24 24 24 26 26



4.3. Model selection	
4.3.1. Create model and model selection	
4.3.2. Channel monitor	
4.3.3. Reset function	
4.4. Model settings (Model Setup )	
4.4.1 Model settings ( Model setup )	
4.4.2. Flight Mode ( Flight Modes )	35
4.4.3. Input Source ( Inputs )	
4.4.4. Mix control (Mixer)	
4.4.5. Output ( Outputs )	44
4.4.6 Curves	44
4.4.7. Global variables ( Global Variables )	46
4.4.8. Logic switches	48
4.4.9. Special Functions	51
4.4.10. Custom Scripts	54
4.4.11. Digital Transmission and Telemetry	55



### 1. Overview

### **1.1. Introduction**

Thank you for purchasing the RadioMaster TX16S 2.4g remote control system. The system is versatile and can be used by beginners and professionals. In order to ensure the correct and safe use of this product, please read this instruction manual carefully before use. The information contained in this manual is subject to change without notice.

TX16S remote control is suitable for all types of fixed-wing, glider, helicopter and multi-rotor aircraft. The model type can be selected according to the aircraft used, and various hybrid functions can be used.

### **1.2. Safety instructions**

Many remote control models are equipped with powerful motors and sharp propellers. Use caution when working on or operating models. When performing assembly or maintenance, make sure that the model is powered off and the propellers are removed.

Do not operate the TX16S remote control system under the following conditions:

• Under severe weather or strong wind conditions, such as rain, hail, snow, storm or electromagnetic environmental conditions.

- Under any circumstances where visibility is limited.
- In areas where people, property, high-voltage power lines, public roads, vehicles or animals may be present.
- If you feel tired or unwell, or under the influence of drugs or alcohol.

• If the remote control or model appears to be damaged or not working properly.

• In areas where 2.4GHz interference is high or where 2.4GHz radios are prohibited.

- When the battery voltage is too low to use.
- In areas where local regulations prohibit the use of aviation models.

### **1.3. Manual and Firmware Download**

TX16S comes pre-installed with standard OpenTX firmware. To download the latest software manual, visit the RadioMaster website: <u>https://www.radiomasterrc.com</u>

To download the latest firmware for your TX16S remote control, visit the OpenTX website: <u>https://www.open-tx.org</u>

### 1.4. Important !

The TX16S comes pre-installed with the most stable firmware. If you are experienced and confident in updating your system firmware, update only the firmware intended for your radio. Incorrect updates may render the remote control inoperable.

### **1.5. Remote Control Overview**





### 1.6. Power and charging precautions

TX16S has built-in USB-C charging function for 3.7v lithium battery. The charging circuit is only suitable for 2x 3.7v lithium-ion 18650 or 2x 3.7v Lipoly batteries (2s 7.4v Lipo battery pack). The nominal battery voltage is 3.7v and the maximum charging voltage is 4.2v.

Do not use a LiFE battery pack or 18650 lithium-ion battery with a nominal voltage of 3.6v. Incorrect battery pack or battery. Using this charging method may cause damage to the remote control or fire.

Check the voltage and condition of the battery regularly and never charge it unattended. Always charge in a safe area away from flammable materials. If the remote control gets wet or damaged in any way, do not charge it.

RadioMaster is not responsible for any adverse consequences caused by using or misusing this product in accordance with safety regulations.

### 1.7. Note

OpenTX software is very powerful and has a large number of programming and mixing functions. Please download the comprehensive software installation guide for more detailed instructions from the following link: <u>https://www.open-tx.org</u>



### **1.8. Specifications**

<u> 规格尺寸: 158 \* 150 \* 58</u>

重量: 338g(不含电池)

传输频率: 2.400GHZ-2.480GHZ

发射器模块: 四合一多协议高频模块(CC2500 CYRF6936 A7105 NRF2401)

发射功率:最大 22dbm(发射功率可调)

天线增益: 2db(可拆卸天线 , 易于更换)

工作电流: 250mA@8.4V

工作电压: 5.5-18v DC

遥控距离: > 2km @ 22dbm

开源固件: OpenTX(遥控器) DIY-Multiprotocol-TX-Module(高频模块)

通道数: 最多 16 个通道 ( 取决于接收器 ) 显示:4.3 英寸 TFT 全彩显 示屏 , 分 辨率为 480 \* 272

云台:非接触式 3D 矢量霍尔操纵杆 JR/FrSKY 兼容模块托架

升级方法: 支持 USB 在线/SD 卡离线升级

协议: 全系列 DSM2/X 全系列 Flysky 和 Flysky 2A FrSKY

有关完整协议列表,请访问:

https://github.com/pascallanger/DIY-Multiprotocol-TX-Module/blob/master/Protocols\_Details.md

### 1.9. Warranty and Repair

If you experiance any problems with your remote control hardware, please keep proof of purchase and contact the retailer where you purchased TX16s.



### **1.10. Firmware Update and OpenTX Information**

For the latest information and firmware updates from the OpenTX open source firmware development team, please visit the OpenTX website at https://www.open-tx.org.

### 1.11. Disclaimer

OpenTX is an open source firmware. No warranty or implied warranty is given for the quality and reliability of this firmware. If not handled properly, the RC model can cause serious injury or even death. If you decide to use OpenTX firmware, you are solely responsible for your model. Any injury or damage caused by using OpenTX firmware

The authors of OpenTX and RadioMaster assume no responsibility. Use with caution.

### 1.12. Legal status and copyright

This project is free software: you can redistribute and / or modify it in accordance with the GNU General Public License Agreement, V3 version agreement, or (optionally) an updated version agreement issued by the International Free Software Association. You should receive a copy of the GNU General Public License Agreement for the OpenTX project. If not, see www.gnu.org/licenses.

OpenTX is open source firmware for RC radio remotes. The firmware is highly configurable and has more features than traditional radios. Daily feedback from thousands of users ensures continuous firmware updates as well as stability and quality.

The release of OpenTX firmware hopes that it will benefit the public, but it has no warranty; it does not even include implied commercial licenses or applicability for a special purpose. For more details, see the GNU General Public License Agreement.

OpenTX source files and more can be found at https://github.com/opentx/opentx.



## 2. OpenTX Companion software (OpenTX companion)

The OpenTX Companion remote control support software is used for many different tasks, such as loading OpenTX firmware to the remote, backing up model settings, editing model settings, and running the remote simulator.

You can run OpenTX Companion software on multiple computer platforms. OpenTX Companion software supports common systems such as Windows, Mac OS X, and Linux. Even without a remote control, you can experience all the functions and settings of the remote control in a computer simulator.

You can get the latest version of OpenTX Companion software here: http://www.open-tx.org/

### 2.1. Software Download and Installation

1. Download the latest version of OpenTX Companion software from http://www.open-tx.org/.

2. Install OpenTX Companion software (take windows version 2.3.6 as an example)

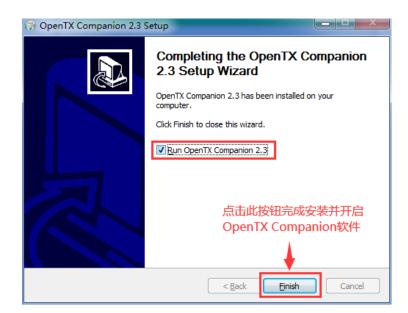
Double-click the installer companion-windows-2.3.6.exe.

🕞 OpenTX Companion 2.3 Setup	
License Agreement Please review the license terms before installing OpenTX Companion 2.3.	<b>North</b>
Press Page Down to see the rest of the agreement.	
Copyright ?2011-2019 OpenTX team	*
OpenTX Companion is based on code named eePe by author - Erez Raviv <erezraviv@gmail.com> This software is provided 'as-is', without any express or implied warranty. In no ev</erezraviv@gmail.com>	
will the authors be held liable for any damages arising from the use of this software	e. –
Permission is granted to anyone to use this software for any purpose, including commercial applications, and to alter it and redistribute it freely, subject to the follo restrictions:	wing .
If you accept the terms of the agreement, dick I Agree to continue. You must accept agreement to install OpenTX Companion 2.3.	ot the
Nullsoft Install System v2.46	Cancel

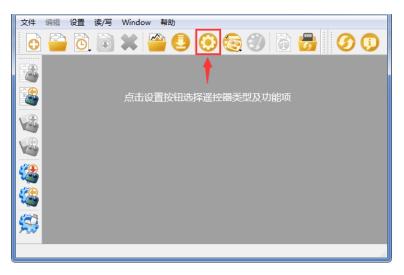
RADIOMASTER

OpenTX Companion 2.3 Setup	
Choose Components	
Choose which features of OpenTX Companie	on 2.3 you want to install.
Check the components you want to install ar install. Click Next to continue.	nd uncheck the components you don't want to
install. Click Next to continue.	
	Description
Select components to install: OpenTX	Companion 2.3 Position your mouse
	over a component to see its description.
	点击此按钮继
Space required: 74.4MB	
ullsoft Install System v2,46	
	< <u>B</u> ack <u>N</u> ext > Cancel
OpenTX Companion 2.3 Setup	
Choose Install Location	Value
Choose the folder in which to install OpenTX	(Companion 2.3. 🛛 🕡
Setup will install OpenTX Companion 2.3 in the click Browse and select another folder. Click	he following folder. To install in a different folder,
and browse and select another rolder. Circ	Next to continue.
	1.选择您想要安装到电脑的位置
Destination Folder	
d:\OpenTX\Companion 2.3\	Browse
Space required: 74.4MB Space available: 40.2GB	2.点击此按钮继续
·	1
ullsoft Install System v2.46	
	< <u>B</u> ack <u>N</u> ext > Cancel
OpenTX Companion 2.3 Setup	
Choose Start Menu Folder	Vinit
Choose a Start Menu folder for the OpenTX	Companion 2.3 shortcuts.
can also enter a name to create a new folder	ould like to create the program's shortcuts. You er.
OpenTX Companion 2.3	
Battle.net	
Betaflight Castlevania Lords of Shadow - Ultimate Edit	
Chrome 应用	
CMake companion9x	
Corel VideoStudio Pro X5 CorelDRAW Graphics Suite X8 (64-bit)	
Delcam DipTrace	
	古土地物加工指令壮 _
DipTrace Language Suite	点击此按钮开始安装
DipTrace Language Suite Do not create shortcuts	二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二
DipTrace Language Suite	品面し友祖介伯女表 <back cancel<="" install="" p=""></back>





At this point, the OpenTX Companion software installation is complete. Please continue to follow the instructions below to continue setting the software to match the RadioMaster TX16S remote control:





遥控器档案	程序首选项 机	莫拟器设置			
档案名称	TX16S 自定	义档案名称 , 此名称	将存储在软件的栏	案列表中	
遥控器型号	Radiomaster TX18	35 从下拉列表框选	择遥控器类型 Rac	liomaster TX16S	•
菜单语言	en 从下拉列	リ表框选择固件菜单的	的默认语言,默认为	<b>为英语en</b>	•
编译选项	📝 ppmus	📃 faichoice	📃 faimode	nooverridech	L .
	🔲 noheli	nogvars	🔽 lua	📕 bluetooth	不允许锁定通道值功能
其他设置	选择固件包含的功	能,这些选项决定从服务	器下载的固件包含哪些	些功能,鼠标停留会弹出	出功能说明 🕈
SD卡目录	E:/opentx/sdcaro	1s/TX16S_0026 电脑仿真	遥控使用的SD卡达	文件夹	选择目录
备份目录	E:/opentx/BACKUP	备份所使用的的默试	认文件夹		选择目录
	🔲 写入固件前允许	7自动备份			
一般设定	允许:遥控器设定(	保存到 2020-02-02 23:47			
默认摇杆模式	MODE2 美国手 🏥	们↔方向 1升降↔副翼	电脑仿真遥控器的	默认摇杆模式	•
默认通道顺序	副翼 升降 油门 ;	方向 [A E T R] 电脑仿	方真遥控器的默认通	<b>通顺序</b>	•
	📝 将版本号添加到	间固件文件的文件名中下载	的固件文件名中将	身包含功能项及版本	号
	☑ 下载完成后提示	卡将固件写入到遥控器 下靠	<b>战固件后系统提示</b> 题	是否将固件写入到通	控器

### 2.2. Use Companion software to upgrade remote controller firmware

After the above settings are completed, click the firmware download button to download the firmware.

Note: The RadioMaster TX16S remote control is pre-installed with stable and reliable OpenTX firmware when it leaves the factory. If there is no special need, please do not update the firmware easily. The remote control will be damaged due to this.

If you have to update the firmware to achieve some functional upgrades, please carefully follow the instructions below. Before updating the firmware, make sure that all steps are correct and operate carefully to ensure that your remote control is successfully updated.

If not required, please skip this section.



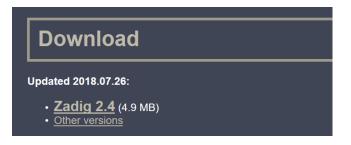
文件 编辑	设置 读/写 Window 帮助
0	) 🖸 🚳 🗱 🚰 🤩 📀 🌚 🚳 💏 💋 🚺
	9 下载
	固件类型 opentx-tx16s-lua-ppmus-en
<b>44</b>	下载最新版本固件 — Download firmware Download SD contents
	OK
	h.

Before writing the firmware, please make sure that the remote control is turned off, and plug in the USB-C (TYPE-C) cable. The following device name will appear in the computer device manager:



Before writing the firmware for the first time, you need to replace the STM32 BOOTLOADER driver to ensure that the OpenTX Companion software can recognize this hardware type and write the firmware correctly. The replacement method is as follows:

Download the latest version of the universal driver replacement software Zadig.exe from https://zadig.akeo.ie/



A. In the Windows system, right-click Zadig-2.4.exe and select Run as administrator



名称	<b>^</b>	修改日期	类型
zadig-2.4.exe		2020 02 12 20.1	2
		打开(0)	
	0	以管理员身份运行( <u>A</u> )	
		启用/禁用数字签名图标	
		Open with Sublime Text	
		H Culeline Terre ITH	

B. In the zadig software, select Options-> List All Devices to view the device list

Zadig			
Device	Op	tions <u>H</u> elp	
		List All Devices	
	$\checkmark$	Ignore Hubs or Composite Parents	▼ Edit
	✓	<u>C</u> reate a Catalog File	More Information
Driver	✓	Sign Catalog & Install Autogenerated Certificate	WinUSB (libusbx)
USB ID		<u>A</u> dvanced Mode	libusb-win32
WCID		Log <u>V</u> erbosity ▶	libusbK WinUSB (Microsoft)
0 devices	fou	nd.	Zadig v2.0.1.160

C. Drop-down list and find STM32 BOOTLOADER device

Zadig		
Device Options Help		
USB Keyboard (Interface 0)		- Edit
USB Keyboard (Interface 0) USB Keyboard (Interface 1)		ation
ISTM32_BOOTLOADER IEEE-1284 Controller 802.11ac WLAN USB Optical Mouse		<u>x)</u>
WCID ?	Replace Driver	libusbK WinUSB (Microsoft)
6 devices found.		Zadig v2.0.1.160



D. Click the Replace Driver button (if the driver has been installed before, Reinstall Driver will be displayed) to replace / install the driver. After the driver installation is completed, you can use OpenTX Companion to write the firmware to the remote controller correctly.

文件 编辑 设置 读/写 Window 帮助	
🔁 🚔 🙆 💓 🛎 🍟 🛃	<b>Ø</b> ()
院录固件	
D:/TX16S-2.3.6.bin 加载	
版本 2.3.6 (7f527622) 变体 219	
日期 & 时间 2020-02-10 20:54:14     ●	
▲ 1000 1000 1000 1000 1000 1000 1000 10	
取消 写入到遥控器	
(論 写入固件到遥控器	×
烧录完成	20% 🔽 显示详情
druppe, continuing	
DFU mode device DFU version 011a Device returned transfer size 2048	
Device returned transfer size 2048 DfuSe interface name: "Internal Flash "可打开详细	信息查看
Downloading to address = 0x08000000, size = 1053560	
File downloaded successfully 固件写入成功	
No valid DFU suffix signature	
	E
No valid DFU suffix signature	E
No valid DFU suffix signature	E
No valid DFU suffix signature	E

At this point, the firmware of the remote control is successfully written. Unplug the USB-C (TYPE-C) cable and you can use it after booting.



### 3. First boot

Press and hold the power button to boot. Before entering the main interface, the system will check the position of the throttle stick and switch and other startup conditions. If the startup conditions are not met, there will be a corresponding error prompt. You need to clear it or press any key to jump Over.

**Throttle warning:** This is a warning that the throttle is not at the lowest position when the machine is turned on. You can set the throttle stick to the lowest position or press any key to skip. You can also turn off the throttle state option in the MODEL SETUP menu. Throttle alarm.



**Switch warning:** This is a warning that the remote control switch is not in the default position. (The default setting is that all switch directions are up  $\uparrow$ )





**Runaway protection not set warning:** This is a warning that the remote control runaway protection is not set.



**Alarm Off Warning:** A similar warning will appear if the sound mode of the remote control settings page is set to mute.

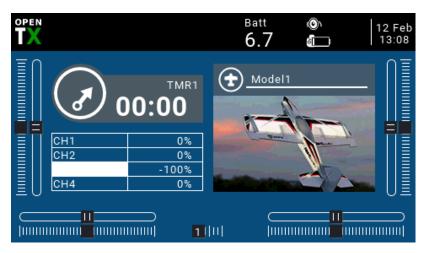


**SD card warning:** The SD card file version used does not match the remote controller firmware version, this warning will appear. The figure requires 2.3V0026 version (the SD card content needs to be updated when upgrading the firmware).





**First page:** the default first page of the system, you can customize the display elements in the page as required.



### 3.1. Calibrate the battery voltage (take 2 3.7V 18650 lithium

### batteries in series as an example)

A. Press and hold the [SYS] button to enter the system settings. Press the [PAGE] key to page to the HARDWARD page, scroll to the bottom of the page, select Battery calibration, and fill in the actual measured battery voltage.



۵ 🎗 🖸	\$\$₽	<b>:</b>		12 Feb 13:16
HARDWARE				
&SG		3POS		
&SH		Toggle		
&SI		3POS		
ୟ SJ		3POS		
Battery calib	ration	6.70V		
RTC Batt		0.00V		
Check RTC v	oltage			
ADC filter				
Debug		Analogs	Switches	

B. Scroll to RADIO SETUP, and fill in the battery level range in the Battery meter range as shown below

③ 次 ₫ ∯ ⊉ 2		12 Feb 13:20
RADIO SETUP		
Date	2020 - 02 - 12	
Time	13:20:41	
Battery meter range	6.0-8.4V	
Sound		
Mode	NoKey	
Volume	0	
Beep volume	<u>O</u>	
Beep length	<u>_</u>	
Beep pitch	+0Hz	

B. On the current page, turn the scroll wheel to find Battrey low (low voltage alarm), and fill in the alarm voltage as shown below. When the remote control voltage is lower than the current set voltage, the system will play a voice and report that the battery voltage is low

ا کې	12 Feb
RADIO SETUP	
Strength	0
Alarms	
Battery low	6.2V
Inactivity	10m
Sound off	
Check RSSI on shutdown	
Backlight	
Mode	OFF
Duration	10s

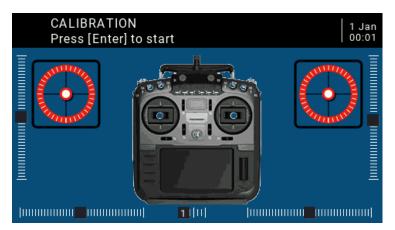


### **3.2. Calibrating Gimbals**

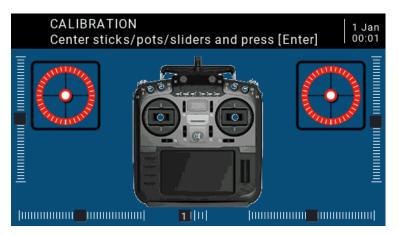
A. In the system settings, scroll to the HARDWARE page, select the Calibration item, and press OK to enter the settings.

	\$}€)  }	<b>1</b>	12 Feb 13:13
HARDWARE			
Calibration			
Sticks			
∕∂Rud			
ଔEle			
ଔThr			
∕∂Ail			
Pots			
ÖS1		Pot with detent	
<b>0</b> 6Р		Multipos Switch	

B. Follow the text prompts at the top for calibration. The first step prompts, press the confirmation key to start

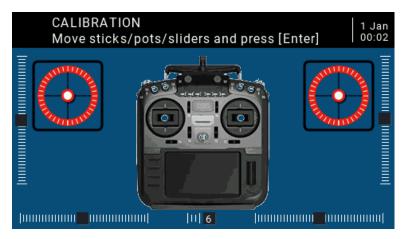


C. In the second step, place all the joysticks, knobs, and side sliders in the middle position. The system obtains the midpoint value, and then press the confirmation key to continue to the next step.





D. The third step reminds that all the joysticks, knobs, and side sliders of the paddle move the maximum and minimum. The system saves the maximum and minimum values. At this time, 6POS (six-speed button) may be pressed one by one. The system records the value of each button. The value of the key can be viewed at the bottom of the page. After all the above steps are completed, press the OK key to complete the calibration, and the system automatically returns to the previous page.





### 3.3. Set the default joystick mode and the default channel output order.

In the system settings, turn the page to the RADIO SETUP page, select the scroll wheel to the bottom of the page, you can see

Default channel order

Mode (Joystick Mode)

Because the channel input order of the built-in multi-protocol transmitting module (high-frequency head) of the RadioMaster TX16S remote control is AETR, in the Default channel order option, be sure to select the AETR order

The last Mode (joystick mode) can be selected according to your personal preferences:

Mode 1 (right-hand throttle / Japanese hand)

or

Mode 2 (left-hand throttle / American)

The icons on the right from left to right indicate the names of the joysticks corresponding to the position of the joystick on the remote control.

Left joystick landscape Left joystick portrait Right joystick portrait Right joystick landscape

Rud = (direction) Thr (throttle) Ele (pitch) Ail (roll

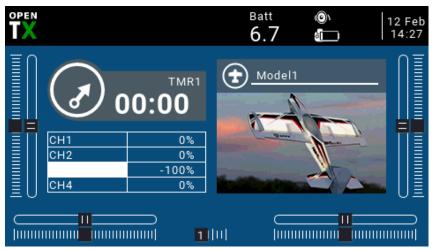
ا الا الا الح الح الح الح الح الح الح ال	12 Feb 13:48
RADIO SETUP	
Adjust RTC	
Coordinate format	DMS
Country code	America
Voice language	English
Units	Metric
Play delay (sw. mid pos)	150ms
USB Mode	Ask
Default channel order	AETR
Mode	2 @Rud @Thr @Ele @Ail



### 4. Remote control menu details

### 4.1. Main interface

The default startup screen is as follows. The user can add the content to be displayed to customize the main interface.



Top menu bar: The default top menu bar displays speaker volume, remote control battery level, receiver signal strength (RSSI), and time and date. Batt is a custom top display remote control voltage, users can also add other display information.

Model menu bar: The model menu bar on the right shows the model name and model picture currently in use.

### 4.2. System settings

Long press the left SYS button to enter the system setting page. The system setting page is divided into 7 sections.

**-TOOLS:** Tool page, which includes the setting function of the spectrum analyzer and some third-party equipment, such as the setting function of TBS Crossfire, Frsky specific receiver settings, and Graupner's receiver HoTT protocol settings.

-SD CARD: SD card page. In this page, you can view the contents of the SD card, and quickly set the startup screen, model pictures, and the function of flashing the built-in / external module firmware.

-RADIO SETUP: The remote control setup page, this page is the basic functions of the remote control and the settings in the default parameters of the remote control.



-GLOBA FUNCTIONS: Global function page. This page can customize various global functions. Global functions are similar to special functions in model parameters, but global functions are shared by all model parameters, while functions in model parameters are only used by the current model.

**-TRAINER:** Coach function page. In this page, you can set the control ratio of each channel from the student mode remote control in the coach mode, and the intervention ratio of the remote control in the coach mode.

-HARDWARE: Hardware setting page. In this page, you can calibrate the joystick and voltage, set the name of the joystick, set the functions and names of switches and knobs, and view the underlying parameters of the hardware.

-VERSION: Version page. On this page, you can view the remote controller hardware type, OpenTX firmware version, and the functional items included in the current firmware.

### 4.2.1 TOOLS (Tool page) description



### 4.2.2 SD CARD (SD Card Page) Instructions





### **4.2.3 RADIO SETUP Instructions**

ا الله الله الله الله الله الله الله ا	12 Feb
RADIO SETUP	
Date E	2020 - 02 - 12 年-月-日
Time 时间	15:12:26 小时:分钟:秒
Battery meter range	6.0-8.4V 主页面电量图形区间
Sound 声音设置类	
Mode 提示音模式 (Beep音)	NoKey ————————————————————————————————————
Volume 系统主音量	○ NoKey-按键不发音
Beep volume 提示音音量	Alarm-只有报警发音
Beep length 提示音时长	Quiet-静音
Beep pitch 提示音音调	+0Hz 范围: 0Hz-300Hz
Wav volume Wav文件语音音量	O
Background volume背景音量	O_
Variometer 回传设置中Variometer	条目的提示音设置
Volume Variometer提示音音量	O
Pitch zero 低位音调	700Hz
Pitch max 高位音调	1700Hz
Repeat zero 重复间隔(毫秒)	500ms
Haptic 震动设置类	
Mode 震动模式	NoKey 与提示音项目及功能相同
Length 震动时长	0
Strength 震动幅度/强度	0
Alarms 报警设置类	
Battery low 遥控电压低语音报警	
Inactivity 长时间无操作语音报警	10m 单位分钟, 10m表示10分钟
Sound off 静音开机警告	■ 如果所有声音设置都关闭了, 开机会警告
Check RSSI on shutdown	■ 如果在未关闭接收机时关闭遥控器,
Backlight 背光设置类	会显示警告信息
Mode 背光触发模式	OFF —— Both-摇杆或按钮操作时亮 Controls-除按键外的操作时亮
Duration背光触发亮起持续时间(秒	)IUS Kevs-只有按键操作时高
ON brightness 开启背光时的亮度	€ ON-常亮 OFF-常关
OFF brightness 关闭背光时的亮度	
Alarm 报警时是否闪烁背光	
Pwr Off delay 关机按钮按下延时	2s 单位: 秒, 2s表示2秒
GPS GPS设置类	0 #團(12) (112)
Time zone 时区 Adjust RTC	0 范围(-12) - (+12) □ 是否根据GPS坐标调整时间
Coordinate format 坐标格式	□ 是各根据GFS里称调整时间 DMS 可选DMS或NMEA格式
Country code 所属地区认证规范	America 可选美国、欧洲、日本
Voice language 语音语种	English 可选多国语言的语音
Units 系统单位	Metric Metric-公制, Imperial-英制
Play delay (sw. mid pos)	150ms连续切换开关时跳过中间的延时
USB Mode USB模式 Ask-每次询问	Ask Joystitck-游戏柄、Storage-U盘
Default channel order	AETR 默认通道输出顺序,必须AETR
Mode 播杆模式: 1-日本手、2-美国手	
MOUC 通行接入。 F日本子、2 美国子	



4.2.4 GLOBAL FUNCTIONS (Global Functions Page) Instructions



4.2.5 TRAINER (coach function page) description

TRAINER	教练 功能	页面			
ලීAil ලීEle ලීThr ලීRud	:= := := :=	100% 100% 100% 100%	CH1 CH2 CH3 CH4	4	个学生机输入通道比例设置
Multiplier <mark>Cal</mark>	1.0 <b>4</b> 0.0	<b>俞入倍率(乘</b> 0.0	<mark>数)</mark> 0.0	0.0	查看4个输入通道值

### 4.2.6 HARDWARE (Hardware setting page) Description

	2 C. () 🗗 🎖	11 Mar 21:07
HARDV	VARE	
Calibra	tion 摇杆、旋钮及滑块	夹校准
	摇杆自定义名称	
<b>B</b> Rud		
<b>ØEle</b>		
<b>O</b> Thr		
<b>ØAil</b>		
Pots 🕻	<b>註钮、滑块自定义名称及</b> 3	功能定义
OS1		Pot with detent
06P		Multipos Switch
OS2		Pot with detent
OEX1		None Pot-普通旋钮
OEX2	-222	None Pot with detent - 带中点定位的旋钮 Multipos Switch - 6段按钮
ଅଧ		Slider - 側边滑块
୭RS		Slider None-禁用
	es 开关自定义名称及功	能定义
& SA		3POS
<b></b> <i>⊠</i> SB		3POS
≻		3POS
& SD		3POS
&SE		3POS 2POS-2段开关 3POS-3段开关
<i>8</i> SF		2POS Toggle - 自回弹开关
& sg	×	3POS None-禁用
& sh		Toggle
&si		3POS
&sj		3POS
Battery calibration		6.70V 电池电压校准
RTC Ba		0.00V 内置板載纽扣电池电压
The second se	RTC voltage	□ 是否检查内置纽扣电池电压
ADC fil		■ 降低摇杆、旋钮跳动的滤波功能
Debug	查看输入原始信息	Analogs Switches



4.2.7 VERSION (Version page) description

🚳 🎉 🗔 🔅 🗊 🎾 😰 🚺 i	1 Jan 00:00
VERSION	
VERS : opentx-tx16s-2.3.6 (2fcb7765)	
DATE: 2020-03-10 TIME: 10:57:08 固件版本号及发布时间	
EEPR : 219	
UID: 0028003F 30345117 30333435	
OPTS: crossfire, flexr9m, internalmulti, multimodule, luac, ppmus 当前固件包含的功能模块	lua,

### 4.3. Model selection

### 4.3.1. Create model and model selection

In the main interface, press and hold the ENT key to pop up the menu (ENT is the wheel button)





Select Model Select to enter the model selection page, which is used to create, switch, delete and copy models.

$(\overline{\ })$	Model1	<del>ያያድ</del> 00:00	Model03	ዋዋዋዋ 00:00
Z	Model04		Model05	
Models	<b>A</b>	****	<b>A</b>	****
Category		00:00		00:00
Category	Model06		Model07	
分类列表	( 🛨	00:00	( 🛨	00:00
		模型	列表	
🖺 0.0GB  🚰 6 Se model2.bin				

### Long press ENT to pop up the model operation menu

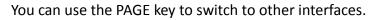
	Model1
	00:00
	Create model 创建模型
odels	Duplicate model 复制模型
	Move model 移动模型
	Create category 创建分类
	Rename category 重命名分类
	长按ENT键弹出选单(ENT键为滚轮按键)
0.0GB •	
model2.	bin



### 4.3.2. Channel monitor

Monitors: used to display the monitoring interface of channel output, mixed control output and logic switch.

6		¥, ¥,	G			11 Mar 22:17
Cł	HANNELS M	ONITOF	₹1-8			
	Ch01 [	0%	1500us ]	Ch05	-100%	988us ]
	Ch02 [	0%	1500us ]	Ch06	-100%	988us ]
ô	Ch03	- 100% -100%	988us ]	Ch07	-100%	988us ]
	Ch04 [	0%	1500us ]	Ch08	-100% -100%	988us ]
	Outputs 📕	Mixers				



The logic switch page can display the status of 64 logic switches. By default, the active state is gray and black is the active state.

8		3.3		3					11 Mar 22:18
LOG	ICAL	SWITC	HES M	IONIT	) R				
	L01 L09 L17 L25 L33 L41 L49 L57	L02 L10 L18 L26 L34 L42 L50 L58	L03 L11 L19 L27 L35 L43 L51 L59	L04 L12 L20 L28 L36 L44 L52 L60	L05 L13 L21 L29 L37 L45 L53 L61	L06 L14 L22 L30 L38 L46 L54 L62	L07 L15 L23 L31 L39 L47 L55 L63	L08 L16 L24 L32 L40 L48 L56 L64	



### 4.3.3. Reset function



### 4.4. Model settings (Model Setup )

### 4.4.1 Model settings ( Model setup )

	22:37
MODEL SETUP	
Model name 模型名称	Model1
Model image 模型图片	nv2.png
Timer 1 计时器1	OFF 00:00:00 触发模式与时间设定
Name 计时器1自定义名称	
Persistent 计时器关机保持	OFF ON-重启遥控不复位计时器
Minute call 每分钟语音播射	G□ Silent-安静模式,不播报
Countdown 倒计时	Silent Beeps-哔哔提示音
Timer 2 计时器2	OFF 00:00:00 Voice-语音播报
Name	Haptic-震动提示
Persistent	OFF 计时器1-3功能完全相同
Minute call	可分别设置同计时及播报模式
Countdown	Silent
Timer 3 计时器3	OFF 00:00:00
Name	
Persistent	Manual Reset
Minute call	
Countdown	Silent
Extended limits	🔲 通道舵量扩展(可扩展至最高土125%)
Extended trims	🗆 Reset 微调量扩展至全通道范围
Display trims 显示微调值	No No-不显示, Yes-显示, Change-更改微调时显示
Trim Step 微调步进值	Fine 可选多种档位步进值
Throttle 油门设置	
Reverse 油门反转	
Source 油门操作源/输入源	
Trim idle only	🗌 油门微调仅影响油门低位怠速部分
	设置(开机检查)不符合设置时会显示警告信息
Display checklist	🗌 显示检查列表
Throttle state	■ 油门低位检查
Switch positions	A↑B↑C↑D↑E↑F↑G↑开关默认位置检查
Pots & sliders	OFF 旋钮/滑块默认位置及检查
Center Beep	RETA12LR 播杆/旋钮/滑块中点提示音
Use global funcs	■ 允许/禁止全局设置应用到此模型
Internal RF 内置无线射频模块	
Mode	MULTI FrSky D8
Module Status	No MULTI_TELEMETRY detected
Channel Range	CH1 - CH16
Receiver No.	00 <u>Bind</u> Range
RF Freq. fine tune	0
Bind on channel	
Disable Telemetry	
Low power mode	( * 肉夕助十次與医療小)
External RF 外置无线射频模块	
Mode	
I rainer 教练模式: Master教练 Mode Bluetooth-蓝牙	注机, Slave学生从机, Jack-音频线连接 Master/Jack Master/Multi-4in1无线教练
Wode Bueloour-My	Waster/Jack Master/Multi-4111无线教练



#### Model Setup Detailed options :

Model name : Enter your model name here.

Model image : You can select a picture file as the model logo in the BMP folder of the SD card. Pictures can be viewed using the SD card manager.

Timer1-3:

Up to 3 fully programmable timers that can count up or down.

ON	Timer is always on
Tht	Start timing the first time the throttle stick is pushed up
THs	Push the throttle stick to timing, pull the throttle stick to the end to stop timing
TH%	Dynamically changing timer speed based on throttle stick percentage
时间值	When set to 0:00, it will count down from 0, otherwise it will count down from the preset value.

### Name:Name the timer

Persistent : The timer keeps shutting down. Checking it means that the timer value is stored in the memory when the remote control is powered off or another model is replaced, and it will be reloaded next time the model is used.

Minute call : Check this option to announce the current timer time every minute

Countdown : -Countdown broadcast, default 10s (10 seconds)

Silent	Quiet mode
Beeps	Веер
Voice	Voice broadcast countdown
Haptic	Vibration alert

Extended limits : Expand the limit. After checking, set the channel rudder limit to ± 125% (default maximum ± 100%).



Extended trims : Fine-tuning extension, allowing fine-tuning to cover the entire joystick range, instead of ± 25%

**Display trims** : Modify the precision of the fine-tuning step. The accuracy can be modified according to actual requirements.

Throttle: Throttle related settings

Reverse : Throttle reverse

**Source** : Throttle operation source (input source), because the throttle trigger timer is used, such as the THs function, it is usually set to the throttle channel instead of the joystick, so that the throttle lever operation triggers the timer correctly

**Trim idle only** : Throttle trim only affects the low position, where trim only affects the idle part of the throttle stroke and does not touch the entire throttle range.

**Preflight Checks** : Pre-flight check, when booting or loading the model, the system will check the following default settings, if it does not match the following model settings, the system will pop up a security warning page

Display checklist : Show checklist

**Throttle state** : Throttle status warning, when the remote control is powered on or the model is loaded, if the throttle stick is not at the lowest position, a warning will be issued

Switch positions : Switch position check, defines whether the remote control checks whether the switch is in a predetermined position when the remote control is powered on or when loading a model. To set them, place all the switches in the way you like, and then press and hold ENT (the confirmation key), the system will save all current switch positions as default values

**Pots & sliders** : Check the position of the knob and slider. The default position of the preset knob and slider is the same as above.

**Center Beep** : Center prompt sound, select whether the joystick, knob and slider will emit a prompt sound when reaching the center point.

Use global funcs : Use global function settings, choose whether to apply global function settings to the current model



Internal RF : Built-in wireless RF module, built-in 4in1 multi-protocol RF module, please refer to multi-protocol RF module manual for usage

External RF : External RF module, compatible with many mainstream RF modules

Trainer : Trainer Mode

Mode

Master/Jack	Audio cable connection, coach host mode
Slave/Jack	Audio cable connection, student slave mode
Master/Bluetooth	Bluetooth wireless connection, coach mode (requires external Bluetooth module)
Slave/Bluetooth	Bluetooth wireless connection, student slave mode (requires external Bluetooth module)
Master/Multi	4in1 multi-protocol module coach host mode (This function needs to add an external 4in1 multi-protocol module as coach input receiver RX mode)

### 4.4.2. Flight Mode (Flight Modes)

The flight mode allows you to set the corresponding fine-tuning value for a specific mission or flight behavior. This item is mainly used for fixed-wing gliders to use different fine-tuning values in different environments. You can customize the fine-tuning value of 1-6 channels, and you can set it for each flight. Mode setting smooth slow-in slow-down time.

	<u> </u>	N)	~¢' (	X		·	) ()	Ouj	12 Ma 01:27	
FLIGHT MODES										
FM0	N/A	:0	:0	:0	:0	:0	:0	0.0	0.0	
FM1		:0	:0	:0	:0	:0	:0	0.0	0.0	
FM2		:0	:0	:0	:0	:0	:0	0.0	0.0	
FM3		:0	:0	:0	:0	:0	:0	0.0	0.0	
FM4		:0	:0	:0	:0	:0	:0	0.0	0.0	
FM5		:0	:0	:0	:0	:0	:0	0.0	0.0	
FM6		:0	:0	:0	:0	:0	:0	0.0	0.0	
FM7		:0	:0	:0	:0	:0	:0	0.0	0.0	
FM8		:0	:0	:0	:0	:0	:0	0.0	0.0	
				.0		.0		0.0	0.0	



There are 8 flight modes plus the default FMO available. The first item of FM1-FM8 requires a trigger switch. When no switch is on, FMO is enabled by default.

Name	Define a name for the flight mode					
Switch	Select the trigger switch for the flight mode. It can be a physical switch or a logical switch.					
Trim selection	Adjust the fine-tuning value of 1-6 channels according to your					
array	actual needs					
Fade in	Slow Ease In / Ease Out Time Settings					
Fade Out						
Check Flight Mode Trims	At the bottom of the screen (below FM8) you are reminded to check the fine-tuning of each flight mode. According to the currently selected FM number, the corresponding reminder message is displayed, for example, if the flight mode FM2 is active, it will display "Check FM2 trims"					

### 4.4.3. Input Source (Inputs)

The Inputs page defines the input source. Before outputting to the channel, you can make preliminary settings for the input source, such as limiting the amount of operation, increasing the curve, using the switch pair to switch, etc.

The input source can be a physical operation source such as a joystick, knob, or switch of the remote control, or it can be a global variable Gvar, a logical switch, return data, etc.

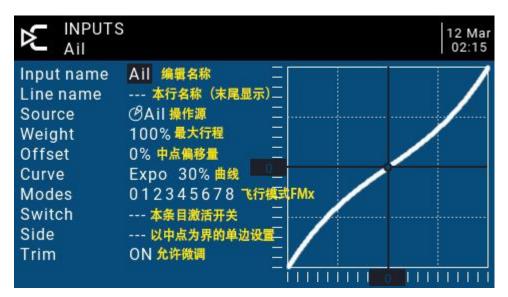
<b>()</b>	<b>H</b>			rť <u>x</u>		<b>/</b>	• •	12 Mar 01:47
INPUTS								
ƘAil	100%	∕∂Ail	cnt		012	3456	78	
€Ele	100%	∕ੴEle	cnt		012	3456	78	
吃Thr	100%	ੴThr			012	3456	78	
€Rud	100%	∕∂Rud	cnt		012	3456	78	
K205								
I <b>C</b> 06								
<b>E</b> 07								
I <b>C</b> 08								
IC 09								

ISTER

To set an entry, press and hold the ENT key on the current entry and a submenu will pop up

INPUTS EAil Edit 编辑条目 E Ele Insert Before 在当前条目之前插入新条目 Insert After 在当前条目之后插入新条目 Copy 复制当前条目到其它位置 K06 Delete 删除当前条目 E07 E08 E09	<b>÷</b>		5   12 Mar 01:57
	だAil だEle だThr だRud だ05 だ06 だ07 だ08	Insert Before 在当前条目之前插入新条目 Insert After 在当前条目之后插入新条目 Copy 复制当前条目到其它位置 Move 移动当前条目到其它位置	

#### 选择 Edit 进入编辑条目



Input name: Name of the current entry. Use the scroll wheel to select a letter or number. Press and hold the ENT key to switch between upper and lower case. Press the ENT key to switch to the next character.

Line name: Because each entry can have multiple lines of configuration, you can give each line a name to avoid confusion in the future

Source: Press and hold the ENT key to enter the input source selection menu. Scroll up or down to the desired category and press ENT to select the corresponding input source



	UTS		12 Mar 02:24
Input nan Line nam Source Weight Offset Curve Modes Switch Side	MAX 固定值 OF OTS 配在 NA 国本 の Cyclic 直升机 同 Trims 微調 の Switches 开き 発 Trainer 教练師	昆合斜盘预设(CY1/C\ €	
Trim	ON	=	

Weight: Normal range is a value between  $\pm$  100% will be zoomed to the joystick operation. If you enter a negative value, for example -100% means reverse the output. Note that channel inversion should not use negative values on the Inputs page, and to reverse channels should be reversed on the Outputs page.

# Offset: Midpoint offset setting

Curve: Curve settings

Diff	Adjust the	stroke amount on one side with the midpoint as the boundary						
Ехро	Expo curve setting. Increasing a positive value will make the joystick smoother an smoother when approaching the midpoint, while increasing a negative value will make the joystick more acute when approaching the midpoint.							
	X>0	Positions above 0 (midpoint) follow the joystick output, operations below the midpoint are all fixed to the midpoint value of 0						
	X<0	The opposite of the previous one						
Func	X	Absolute values, negative values less than the midpoint will always become positive values, and the actual performance is a V-shaped curve						
Preset function	f>0	Below the midpoint 0 is fixed at midpoint 0, above the midpoint is fixed at 100, the actual performance is that the joystick becomes 0 and 100 to switch, there is no intermediate process						
	f<0	The opposite of the previous one						
	f	Above the midpoint is fixed at + 100%, and below the midpoint is fixed at -100%. The actual performance is that the joystick becomes -100% and + 100% to switch. There is no intermediate process.						
Cstm	Call custor	n curve (CV1-CV32), custom curve is set in curve page CURVE						



Modes: Select the corresponding flight mode, and the output trimming value that affects this entry can be set by the flight mode entry

Switch: Select the switch to activate this item (Note: This setting is added to this item to add multiple lines of different settings to switch, if there is only one line setting, do not set the activation switch, otherwise the switch will cause this item to be completely invalid)

Side: Unilateral setting with the midpoint as the boundary. No matter how this item is set, it will be set to unilateral effect by Side.

x>0	All below the midpoint are fixed at 0, and normal output above the midpoint
x<0	All above the midpoint is fixed at 0, and normal output below the midpoint

**Trim**: You can choose whether the fine-tuning is effective for this entry, or you can define a fine-tuning that affects this article separately.

## 4.4.4. Mix control (Mixer)

Ð	EH		12xh2	03:52
MIXE	S			
CH1	100%	ƘAil		∕≣AilR
CH2	100%	Ƙ€Ele		I Elev
CH3	100%	€CThr		
CH4	100%	Ƙ€Rud		🖻 Rudder
CH5	100%	& SA		
CH6	100%	& SB		
CH7	100%	≻		
CH8	100%	& SD		
CH9				
CH1		-100%	🛯 🐹 🔪 🚺 🛛	-100%

#### Mixing page for channel settings

The mix control page allows you to combine as many input sources as you want and map them to any one or more of the 32 output channels. Finally use the next page (Outputs) to make these purely logical outputs to fit the model device

You have complete flexibility in controlling the mixing from any input to any output channel.



A mix puts one input into one channel. The inputs are configured in the Inputs page, which defines any input type.

The mixing control page can also use other channels as the source of the current channel, and output from the current channel after re-mixing. It can also mix one or more channels to another or multiple channel outputs, which can combine very powerful complex functions.

All inputs range from -100% to + 100%. Joysticks, knobs, sliders, channels, global variables, and coach input.

If you want the servo of the No. 2 plug connected to the receiver to be controlled by lifting (ELE), you only need to create a mixing entry on CH2 and use the Ele input as the source of operation.

Each channel can have many lines, and you can choose the operation between each line. Long press the ENT key and select Insert Before / After to create a new line.

By default, all lines on the same channel are added together, and the next line can choose to be superimposed or multiplied with the channel value of the previous line, and replaced completely.

Please note that the currently active row of settings will be displayed in a bold font, making it easy to recognize the item currently in use at a glance. The CH1 channel shown in the figure is input by the Ail joystick, and the three states of the SA switch are used to switch three stroke amounts.

€	EH	n∭n  ⊳⊂	8	rtxa	21:17
MIXE	S				
CH1	100%	ƘAil		(ÚSA∖↑	∕≣AilR
$\odot$	80%	ƘAil		ŪSA-	∕≣AilR
$\odot$	60%	ƘAil		Ūsa↓	∕≣AilR
CH2	100%	l€Ele			Intervention
CH3	100%	€CThr			Image: Motor
CH4	100%	€Rud			In the second secon
CH5	100%	& SA			
CH6	100%	& SB			
CH7	100%	≻			
CH1			∎ <u>⊗</u> ) ► (	CH1	

To edit a mixing control, use the scroll wheel to select the mixing control item up and down, and press and hold the ENT key to enter the editing submenu. Select Edit and press the ENT key momentarily.



	s she se o	13 Mar 21:25
MIXES CH1 10 Edit @#&R		ilR
<ul> <li>③</li> <li>⑥</li> <li>0</li> <li>0</li></ul>	条目到其它位置	iIR iIR lev lotor udder
CH5 100% @SA CH6 100% @SB CH7 100% @SC		
CH1	🐹 🗅 🗟 CH1	

Detailed settings for mixing entries

MIXES CH1			13 Mar 21:35
Mix name 名称 Source 来源 Weight 行程量 Offset 中点偏移量 Trim 是否允许微调 Curve 曲线 Modes 飞行模式 Switch 激活开关 Warning 提示音	AiIR I©AiI 100% 0% ■ Diff 0% 012345678 SA↑ OFF Poplace	Delay up Delay dn <sup>延时设置</sup> Slow up Slow dn <mark>慢放设置</mark>	0.0 0.0 0.0 0.0
Multiplex 叠加方式 CH1	Replace	CH1	

Mix name: Name setting Use the scroll wheel to select letters and numbers, and press and hold the ENT key to switch between upper and lower case. Short press the ENT key to set the next character.

Source: Long press the ENT key to pop up the input source category menu.



CH1	ES	13 Mar 21:48
Mix name Source Weight Offset Trim Curve Modes Switch Warning Multiplex	<ul> <li></li></ul>	0.0 0.0 0.0 0.0
CH1	🕺 💽 🕺 СН1	

Weight: Channel travel amount, the range is -500 / + 500. The default value is 100. Negative values indicate reverse channel output.

**Offset**: Midpoint offset, you can add the offset of the input value, positive or negative. Range is -500 / + 500

**Trim**: You can choose whether the fine-tuning is effective for this entry, or you can define a fine-tuning that affects this article separately.

Diff	Adjust the stroke amount on one side with the midpoint as the boundary							
Ехро	Expo curve setting. Increasing a positive value will make the joystick smoother and smoother when approaching the midpoint, while increasing a negative value will make the joystick more acute when approaching the midpoint.							
	X>0	Positions above 0 (midpoint) follow the joystick output, operations below the midpoint are all fixed to the midpoint value of 0						
	X<0	The opposite of the previous one						
Func Preset function	x	Absolute values, negative values less than the midpoint will always become positive values, and the actual performance is a V-shaped curve						
	f>0	Below the midpoint 0 is fixed at midpoint 0, above the midpoint is fixed at 100, the actual performance is that the joystick becomes 0 and 100 to switch, there is no intermediate process						
	f<0	The opposite of the previous one						
	f	Above the midpoint is fixed at + 100%, and below the midpoint is fixed at -100%. The actual performance is that the joystick becomes -100% and + 100% to switch. There is no intermediate process.						

Curve: Curve settings



Count	Cstm	
-------	------	--

Call custom curve (CV1-CV32), custom curve is set in curve page CURVE

Modes: Select the corresponding flight mode, and the output trimming value that affects this entry can be set by the flight mode entry

Switch: Select the switch to activate this item (Note: This setting is added to this item to add multiple lines of different settings to switch, if there is only one line setting, do not set the activation switch, otherwise the switch will cause this item to be completely invalid).

## Warning: Set the alert tone

Multpx: Superposition method, output after superimposing with the value of the previous stroke amount

- Add: Additive superposition, the current value is added to the value of the previous line and output
- Multiply: multiplication, the current value is multiplied by the value of the previous line and output
- Replace: direct replacement, the value of the previous line is directly replaced by the value of this line

The combination of these operations allows the creation of complex mathematical operations and is often considered one of the biggest benefits of using JumperTX.

Delay Up/Dn: The response of the output can be delayed as the input changes. (In seconds).

Slow Up/Dn: Regarding input changes, the response of the output can be slowed. For example, slow speed can be used to slow down retraction driven by a normal proportional servo. The output will cover the time in seconds from 100 to + 100%.

# 4.4.5. Output ( Outputs )

Total output page, final channel output overall settings

•			N B	٢	φ X		<b>~</b> ) <b>°</b>		3 Ma 2:13	
OUTPL	JTS	中点	低位		高位 〕	正反向	曲线	绝对中点	模式	
CH1 -		0.0	-100.0		100.0	<b>→</b>		1500	Δ	
CH2 -		0.0	-100.0		100.0	<b>→</b>		1500	Δ	
CH3 -		0.0	-100.0	-	100.0	<b>→</b>		1500	Δ	
CH4 -		0.0	-100.0		100.0	<b>→</b>		1500	Δ	
CH5 -		0.0	-100.0	-	100.0			1500	Δ	
CH6 -		0.0	-100.0		100.0	<b>→</b>		1500	Δ	
CH7 -		0.0	-100.0	-	100.0	->		1500	Δ	
CH8 -		0.0	-100.0	-	100.0	<b>→</b>		1500	Δ	
CH9 -		0.0	-100.0	5	100.0			1500	Δ	

		20	ſ	Ý 🗶 (		O		3 Ma 22:25
OUTPUTS								
CH25	0.0 -	100.0		100.0	+		1500	Δ
CH26	0.0 -	100.0		100.0	->		1500	Δ
CH27	0.0 -	100.0		100.0	->		1500	Δ
CH28	0.0 -	100.0		100.0	->		1500	Δ
CH29	0.0 -	100.0		100.0	$\rightarrow$		1500	Δ
CH30	0.0 -	100.0		100.0	->		1500	Δ
CH31	0.0 -	100.0		100.0	->		1500	Δ
CH32	0.0 -	100.0		100.0	<b>→</b>	1	1500	Δ
T	rims => S	Subtrin	าร	一键填入,	將徵	周按钮的值	直接填入中	点值

## 4.4.6 Curves

The curve can be used to modify the control response in the Inputs, Mixes, or Outputs page. Standard curves containing Expo and Differential can be used directly in these sections. This page is used to customize any kind of curve.

Can set up to 32 curves

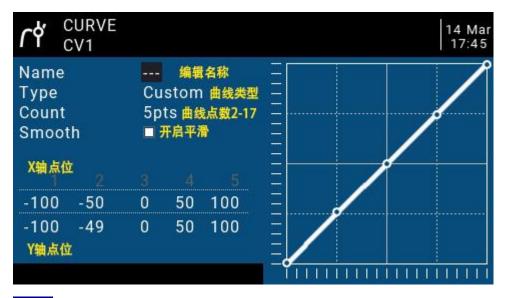


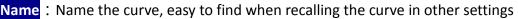
€	Ξ(	₽₩₽₽	ሰ 🗴	<₽ ✓	0	14 Mar 17:41
CURV	/ES					
CV1		5pts	Г			
CV2		5pts				
CV3		5pts				
CV4		5pts				
CV5		5pts	_		$\mathbf{I}$	
CV6		5pts				
CV7		5pts				
CV8		5pts				
CV9		5pts				

The curve can be between 2 and 17 points and can have a fixed or user-definable x coordinate.

X value represents input, such as the course of the joystick from low to high

Y value represents output, such as the process of channel output from low to high





Type : Curve type

Standard	Standard type, only Y point (output) can be edited, ranging from -100 to 100
Custom	Custom types, both X (input) and Y (output) points are editable, ranging from -100 to 100
Count	• The number of points on the curve between 2 and 17

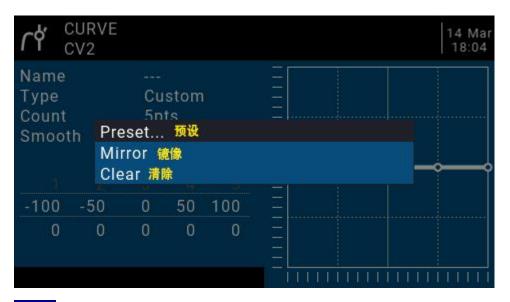
Dints on the curve, between 2 and 17.



Smooth : If checked, create a smooth curve through all points.

When customizing, move the cursor to X and Y coordinates, and change the position of each coordinate point according to your needs.

Depending on the type selected above, this allows writing the X coordinate of a standard curve, or the X and Y coordinates of a custom curve.



Long press the ENT key on the coordinate point to enter the submenu:

**Preset** : Select presets with slopes of -45 °, -33 °, -22 °, -11 °, 0 °, 11 °, 22 °, 33 °, 45 °. When defining more complex curves, choose reasonable presets Will reduce some steps.

Mirror : Mirror the curve vertically.

Clear : Clear the current curve.

### 4.4.7. Global variables (Global Variables)

Global variables are customizable values that can be used as temporary values for custom operations. In complex functions, the values of global variables are automatically modified through certain trigger conditions for conditional judgment or any other purpose. Global Variables can be used as input or output real-time adjustment parameters, and can also be used as parameters in flight mode and curve definition. Global variables can be used in any place where numerical values can be entered to achieve some automated control.

They are also specific flight modes, which avoids having to use separate mixing lines with different values for each flight mode. This greatly simplifies mixing pages and makes them easier to understand.



By using the "Adjust GVx" option in the Special Functions page, you can even adjust global variables on the fly, so you can quickly optimize settings such as doublerate ratio, exposure, differential, flap to elevator conversion, and more. If pop-ups are enabled (indicated by! Next to the GV label), when the variable is updated, a pop-up window with the variable name and new value will be displayed on the main view.

"Global" means that global variables can be used to set pages for the entire model, but not for all models. Each model has its own set of global variables.

		<b>≥</b>	<u>)</u>	¥'r¢					4 Mar 18:18
GLOBAL VARI	AI	BLES					V	alue on	FM1
GV1	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV2	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV3	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV4	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV5	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV6	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV7	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV8	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV9	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0

There are 9 global variables available.

Modify the value directly or press and hold the ENT key to pop up the sub-menu to change the type and parameter of the global variable.

<b>(</b>	H			sro	X	2		1	4 Mar 18:23
GLOBAL	GLOBAL VARIABLES								
GV1	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV2	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV3	Edit	编辑						FM0	FM0
GV4	Clear							FM0	FM0
GV5	U	TIVIU	TIVIU	<b>FIVIU</b>	TIVIU	<b>FIVIU</b>	TIVIU	FM0	FM0
GV6	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV7	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV8	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0
GV9	0	FM0	FM0	FM0	FM0	FM0	FM0	FM0	FM0



X GVARS GV1=0		14 Mar 18:25
Name	定义名称	
Unit	- 单位,可选正常数值或百分比	
Precision	0 精度,可选以小数方式使用	
Min	-1024 最小值	
Max	1024 最大值	
FM0	0 对应FM0的数值, 默认值	
FM1	FM0	
FM2	FM0 FM1-FM8的值可单数	₩ 2000
FM3	FM0 默认为全部使用FMC	
FM4	FM0	

Name: Setting name

Unit: Units, switchable between normal and%

**Precision**: Precision, which can be used in decimal mode. You can set this mode corresponding to the percentage.

Min: Minimum value, which can be limited when the value is changed dynamically

Max: Maximum value, which can be limited when using dynamic change values

**FMO-FM8**: You can specify a value for each flight mode or set it to be the same as the other flight modes. Press and hold the ENT key to switch the input value and select the flight mode in this field. When editing a value, it will increment / decrement by 1 or 0.1, depending on the "Precision" setting above.

### 4.4.8. Logic switches

The logic switch is a user-programmed virtual switch. Like the physical switch, the logic switch is also a switch, but unlike the visible switch, which can be moved by hand, the logic switch is an internal switch triggered by some conditions. The judgment condition you set allows the remote control to automatically turn on or off the logic switch to achieve a certain or a series of automated actions.



€			h 2 x		2000	15 Mar 20:02
LOG	CAL SI	WITCHES				
L01	a <x< td=""><td>₫A1</td><td>11.0V</td><td></td><td>1.000</td><td></td></x<>	₫A1	11.0V		1.000	
L02			0			
L03		7.7.7	0			
L04			0			
L05		7.07	0			
L06			0			
L07		7.7.7	0			
L08			0			
L09			0			
	unction 功能	V1	V2	AND Switch 与运算开关	Min Duration 保持时间	Delay 延时

The setting of the LO1 example in the figure is expressed as follows: When the return value A1 is less than 11.0V, the LO1 switch is automatically turned on. In the settings of other pages, LO1 has the same function as the physical switch. You can define the corresponding function for LO1 on or off. In this way, a switch is automatically executed according to the parameters that change in real time.

The remote control system provides 64 logic switches, each of which has three judgment methods:

1. Compare the values of parameters a and b, a corresponds to V1, b corresponds to V2, a and b can be any source, such as input source, channel, switch, or return item, etc.

2. Compare the value of parameter a and data x, a corresponds to v1, x corresponds to v2, and x is a fixed value, which is used to compare with parameter a

3. Parameter a can be compared with its own calculation result. For example, the change of parameter a itself can affect the current state of the logic switch.

#### Functions

	Triggered when the parameter v1 is equal to the data v2. For example, if
a=x	the thr joystick is less than -90, the current logic switch is turned on
	when the thr joystick is less than -90%.
a~x	Triggered when the parameter v1 is approximately equal to the data v2,
d~X	approximately equal to the range of about 10%
a>x	Triggered when parameter v1 is greater than data v2



a <x< td=""><td>Triggered when parameter v1 is less than data v2</td></x<>	Triggered when parameter v1 is less than data v2
a >x	Triggered when the absolute value of parameter v1 is greater than v2, the absolute value is that it will become positive no matter whether it is positive or negative
a  <x< td=""><td>Triggered when the absolute value of parameter v1 is less than v2</td></x<>	Triggered when the absolute value of parameter v1 is less than v2
AND	AND operation is triggered when both parameters v1 and v2 meet the conditions. For example, v1 is the switch SA $\uparrow$ and v2 is SB $\uparrow$ , which indicates that the current logic switch can be turned on when both SA and SB switches are in the $\uparrow$ position.
OR	OR operation, which can be triggered when one of the parameters v1 and v2 meets the conditions, or when all the conditions are met
XOR	Exclusive OR operation, triggered when one of the parameters v1 and v2 meets the conditions, not triggered when all the conditions are met or all the conditions are not met
Edge	Is a momentary switch (very short duration, about 30 ms), it will be triggered when V1 meets the conditions V1: Can be physical switch, logic switch, trim button V2: It is divided into two parts [t1: t2], t1 is the minimum value, and t2 is the maximum duration of V1. The logic switch is triggered only after t1 when V1 meets the conditions, and is closed before t2. If t2 is left as "" then only t1 is applicable. When V1 changes from on to off (ie falling edge), the logic switch will be triggered, and then the logic switch will be turned on for 1 processing cycle (about 30 ms). If t2 is set to "<<", the logic switch (ie, rising edge) is triggered when V1 changes from off to on.
a=b	Triggered when the parameter v1 is equal to the parameter v2. For example, when the value of the thr joystick and the value of the ail joystick are equal, the type of v2 at this time is not digital data, but a source
a>b	Triggered when parameter v1 is greater than parameter v2
a <b< td=""><td>Triggered when parameter v1 is less than parameter v2</td></b<>	Triggered when parameter v1 is less than parameter v2

ي پ	
RADIÔMASTER	

∆≥x	$^{\triangle}$ is the mathematical symbol Delta (difference value). It is triggered when the difference of the parameter v1 itself is greater than or equal to the value of data v2. Switch, this item only judges the difference when v1 changes from small to large
△ ≥x	Triggered when the absolute value of the difference of the parameter v1 itself is greater than or equal to the value of v2. This judges the absolute value. Since the negative value also becomes positive, a change from v1 to v or from v1 to trigger the current logic switch
Timer	The switch that automatically loops all the time. V1 is the on time and v2 is the off time. It can be defined by v1 and v2 to automatically cycle at constant intervals.
Sticky	v1 can only switch on, v2 can only switch off

AND Switch: With the arithmetic switch, this item can set any physical switch and logic switch. The current logic switch can be triggered when the switch set by this item and the current item meet the conditions

**Duration**: Hold time, the length of the current logic switch after it is triggered. If there is no parameter, the default is always on. If this item is set for time (0.1-25 seconds), the current logic switch will automatically turn off after this time.

Delay: Delay, after the trigger is turned on, the range is 0.0 to 25 seconds.

# 4.4.9. Special Functions

The combination of logic switches, special functions, global variables, and passback items opens up a variety of exciting new features for the RadioMaster TX16S. E.g :

-Changes in battery voltage data returned by the receiver can trigger voice alerts

-Altitude data returned from the barometer on the aircraft, real-time broadcast of the aircraft's altitude

-By defining voice for the switch, real-time voice broadcast operation on the remote control

-Use logic switches and global variables to let the remote control perform a single or a series of automated actions



-Call lua scripts with switches or logic switches for more advanced custom functions

-Use the knob to adjust the volume

-Use the switch to adjust the backlight brightness

In addition to a few of the commonly used methods listed above, the everchanging features allow you to realize your imagination

Ð	EH	) Milles Server (100) Milles Server (100) Mill	Y 🗶 🗟 🖌 🌍	0 15 Mar 21:56
SPEC	IAL FU	NCTIONS		
SF1	SF₁↑	Override CH3	-100	
SF2	L01	Play Track	lowbat	3s
SF3	ON	Volume	୭LS	
SF4				
SF5				
SF6				
SF7				
SF8				
SF9				

The three examples in the picture are represented as :

**SF1** : When the SF switch position is 1, the CH3 channel will be covered by -100. Usually this setting is used to lock the throttle.

**SF2** : When the logic switch LO1 is automatically turned on, lowbat (low battery voltage) voice will be broadcasted. The rightmost 3s means that the voice will be broadcasted every 3 seconds. Automatically turn on when

SF3 : When the remote control is activated, the LS slider is defined as a function to control the system volume

Each model can have 64 special functions. In addition, there are 64 global settings that are common to all models. To use the global function, please enter the Global Functions page in the remote control system settings to set it.

Each setting is activated with a trigger switch. You can select physical switches, logical switches, fine-tuning buttons, and flight mode. There are two other special options, ON and Ones (which are always enabled when the machine is turned on), and One (which is performed only once when the machine is turned on)



Press and hold the ENT key to enter the sub-menu for displaying sources by category. Scroll up or down to select the desired category and press the ENT key.



The following functions are triggered by the switch selected above

Override	Override channel value				
Trainer	Coach mode enable switch, it is recommended to set to SH rebound switch this switch is used to activate or stop the operation of the student machine				
Inst.Trim	One-touch saves the current joystick position as a fine-tuning value				
Reset	Reset, you can choose to reset all or reset one way individually. The content of the reset option is the same as that in the main interface				
Set Time	Used to set the timer, set the timer time and turn on when the switch is turned on				
Adjust	Adjust the global variable Gvar and enter a fixed number directly Press and hold the ent pop-up menu to change the way to set Gvar. There are three options: Mixer Source: Set the value of Gvar with an input source Global var, another global variable Inc / Decrement: increase or decrease				
Volume	Select a knob or slider to adjust the volume				
SetFailsfe	Use the switch to set the receiver's runaway protection anytime, anywhere				



	Play a sound				
Play Sound	! 1x: Play sound once, not at startup				
	1x: Play sound once.				
	1s-60s: broadcast at intervals (seconds)				
Play Track	Play wav file in SD card, single broadcast and loop broadcast are the same as above				
Play Value	Voice broadcast value, can broadcast values from any source, such as real-time values such as joystick, voltage, altitude, time, etc.				
Lua Script:	Call the specified script, and the script file should be placed in the SCRIPTS / FUNCTIONS / folder of the SD card.				
BgMusic	Background music, loop play wav files, take effect immediately after power on				
BgMusic II	Pause background music				
Vario	Broadcast Vario value				
Haptic	shock				
SD Logs	Start recording logs, save on SD card, can set time interval 0.2-25.5 seconds				
Backlight	To control the brightness of the backlight, you must first define the backlight ON and OFF brightness in the system settings. This uses the switch to switch the corresponding ON and OFF brightness of the backlight.				

# 4.4.10. Custom Scripts

Custom script allows you to customize the functions of the remote control. The scripting language used is Lua, which is a lightweight embeddable scripting language. You need to implement custom functions in the remote control. There are three basic types:

One-time: The script runs only once and then terminates. Initialization of some parameters, and a wizard for creating a new model. The script is stored in the SCRIPTS folder of the SD card.

Mix: A script that executes in a loop, similar to the main program, and is always executed during remote operation.



Function: The script is called in Special Functions. This script is only allowed to execute when the switch in the special function is turned on, and closed when the switch is turned off.

There are some caveats-if the script stops executing, you should never use Lua model scripts to control any aspect of the model that might cause a crash. The reason is that if the script tries to use too much CPU time or memory, it will be closed and it will not run again when the model is selected.

Ð	E H M C C C C C C C C C C C C C C C C C C
CUST	OM SCRIPTS
LUA1	
LUA2	
LUA3	
LUA4	
LUA5	
LUA6	
LUA7	
LUA8	
LUA9	

"The Custom Scripts page is for mixed-type scripts that run continuously. These scripts should be placed in the / SCRIPTS / MIXE / folder of the SD card.

There can be up to 9 custom scripts.

For script development and documentation, please refer to the OpenTX 2.3 Lua Reference Guide:

https://legacy.gitbook.com/book/opentx/opentx-2-3-lua-reference-guide/details

### 4.4.11. Digital Transmission and Telemetry

Each value received via digital transmission is considered a separate sensor with its own properties. Multiple identical sensor types can be connected, but the physical ID must be changed. For example, a sensor for each battery in a 2-6S lithium battery, or monitoring individual motor currents in a multi-motor model. Each sensor can be reset individually with special functions.

Receiver Signal Strength Indicator (RSSI): The value transmitted by the receiver in the model to the remote control, indicating the strength of the received signal. The



warning can be set to warn when it is below the minimum, indicating that you are in danger beyond the flight range. Factors affecting signal quality include external interference, long distances, poor steering or antenna damage, etc.

It is not an absolute measurement, but a number that represents the ratio of the signal to some initial "good" value. The number is relative, but can indicate that the model may be close to the range limit of the controlling aircraft.

When the return signal is completely lost, the remote control will prompt "Lost return signal". Please note that due to a failure of the return link, the remote control can no longer warn you of RSSI or any other alarm conditions, so no further alarm sounds.

Digital settings :

Ð	ΞH	n∭n k⊂ 30	(Brie)	X	🗸 💽 🥝	15 Mar 23:55		
TELE	METRY							
RSSI	信号强度							
Source 信号强度检查源			(default) 默认内置无线模块					
Low alarm			45 信号弱报警值					
Crit	ical alarr	n	42 信号危险报警值					
Disable telemetry alarms 🛛 选中后关闭以上两项报警								
Sens	ors		Value -	1		ID		
1:	RxBt	*	5.2V			224		
2:	TRSS	**	0dB	— 一些	回传的项目	248		
3:	TQIy	*	0			248		
4:	RSSI	*	75dB -	1		248		
Discover new sensors 扫描和发现新的回传项目								
100 M 100		ensor 🕴						
Delete all sensors 删除全部回传项目								
		nces		忽略所有回作	专项目的ID			
Variometer 随垂直速度变化音调的提示音								
		目源为vspd			0.000000			
			-10					
Cen	iter 死区, I	式认±0.5m/s	-0.5	0.5	Tone			