



Spirit RS is stabilisation system for R/C aircrafts featuring control unit and receiver in one extraordinary package!

It combines the best available technologies from both worlds to offer cutting edge experience.

In other words, Spirit RS consists from Spirit 2 hardware and JETI Duplex receiver.

### **Control part**

- 12-axis Sensor Fusion
- Performance-line ARM processor

### **Receiver part**

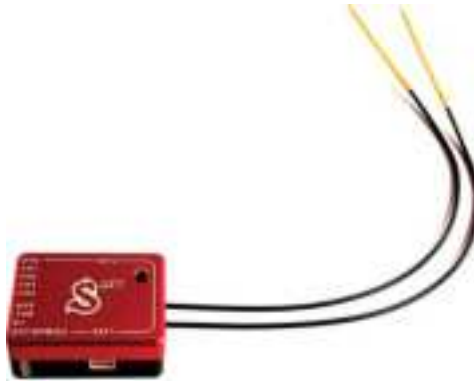
- JETI Duplex 2.4Ghz full-range telemetry receiver

To ensure pilot can operate model reliably and safely with the highest standard in R/C industry, all DUPLEX radios can be easily bound.

With additional DUPLEX TU2 module Spirit RS can be operated also with any other radio!

For our pilots we offer the latest JETI model DS-12, that is 16 channel radio, tailored specially for Spirit RS.

Following pages are covering complete setup of your radio and unit to prepare everything for the first flight.



# CONTENTS

## Preparation

- Safety notes
- Radio Preparation

## Mounting

- Mounting at the model

## Wiring

- Servo wiring and Power Supply
- JETI telemetry sensors
- Spirit ESC Telemetry
- Spirit Governor

## Binding

- Binding with Radio

## Setup

- Configuring Spirit RS from Radio
- Configuring Spirit RS from Computer

## Certification

- FCC Declaration of Conformity

# SpiritRS Safety

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R/C models such as helicopters are not toys! It is necessary to check all the manufacturer instructions of the model, comply with local laws and to perform pre-flight inspections of the model to address all possible mechanical concerns, electrical concerns and failures immediately.

Rotor blades and propellers rotate at high speed and can lead to serious injury to persons and property if not respected.

If you encounter any problems, contact your dealer or other experienced modelers.

Pay particular attention to your own safety and the safety of others. Never fly amongst or over people, animals, or on private property without prior authorization from the property owner. Fly only in safe places where no additional damage is possible to other objects, because the model can suddenly become unmanageable for various reasons, such as failure of electronics, mechanical failure, pilot error or radio interference.

Do not try to fly damaged models or perform repairs using damaged parts; always replace damaged parts with new ones. Never fly a model which exhibits excess vibrations, this may cause unwanted flight characteristics or in-flight failures. Find the source of the vibrations and fix the problem.

 **Spirit RS** is not an autopilot, it is necessary to have knowledge of flying R/C models. The system is only designed to improve flight experience. We recommend using R/C simulators designed for training before the first flight.

**The user takes full responsibility for any damage or injury caused while flying an R/C model equipped with one of our devices. The manufacturer can neither guarantee nor control the conditions in which the unit is being used.**

# SpiritRS Preparation

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To operate Spirit RS unit any JETI DUPLEX radio can be used.

Supported radios are:

- DC-14
- DC-16
- DC-16 II
- DC-24
- DS-12
- DS-14
- DS-16
- DS-24

We recommend to start with clear model profile as you will need only few changes.

Spirit System offer DS-12 radio tailored specially for the Spirit RS. This mean you will be able to utilize completely all features out of the box.



## Contents

- 1 Beginning
- 2 Turning On and Off
- 3 New Profile
- 4 Basic Helicopter settings
  - 4.1 Flight Modes
  - 4.2 Throttle Curve
  - 4.3 Pitch Curve
  - 4.4 Gyro Gain

# **1 Beginning**

First from all you should carefully read radio manual. Once you understand all the particulars you can change Mode if needed. This is fully described in the included manual. When securing bottom cover after Mode change please pay extra attention that no cable is in way of a screw.

Secondly remove cover made of foil from display.

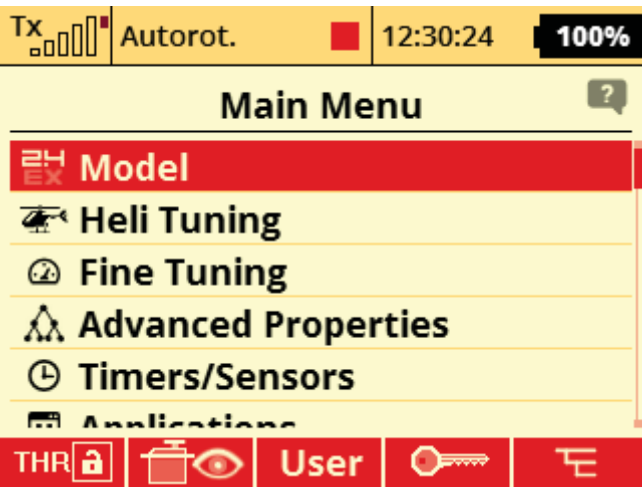
## **2 Turning On and Off**

By pressing Power button you should be able to start the radio. If not, please use supplied charger and charge the battery. By pressing the Power button again, you can turn radio off.

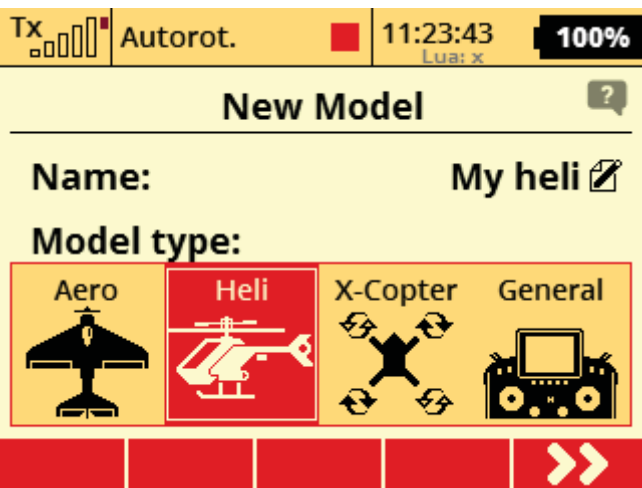
### 3 New Profile

If you are new to the JETI radios, please proceed according following steps.

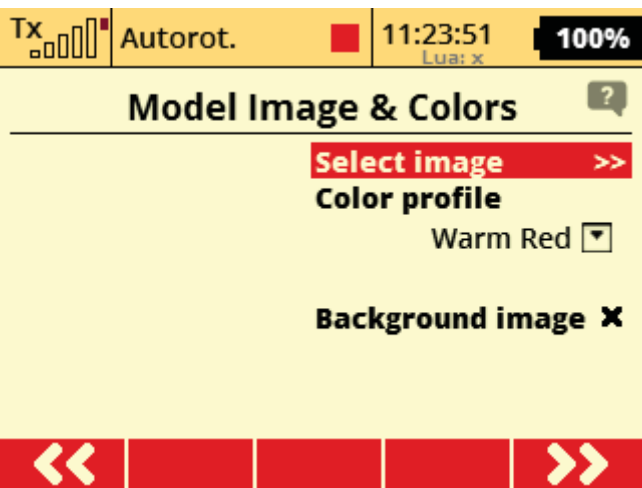
Start the radio and press MENU button. Then enter the Model menu by pressing the Rotary knob.



Select New Model, enter name of the Model and select Heli type. Then continue by pressing right button under display.



Model Image & Colors Menu can be optionally configured according your preference. Continue to another page by pressing button under display.



In the Basic Properties menu select Heli to Spirit and continue to another page. (Please note transmitter update 5.04 is required for this option - only available in DS-12 Spirit Edition at the moment).



Confirm until you will be prompted to Create and activate model. Select Yes.



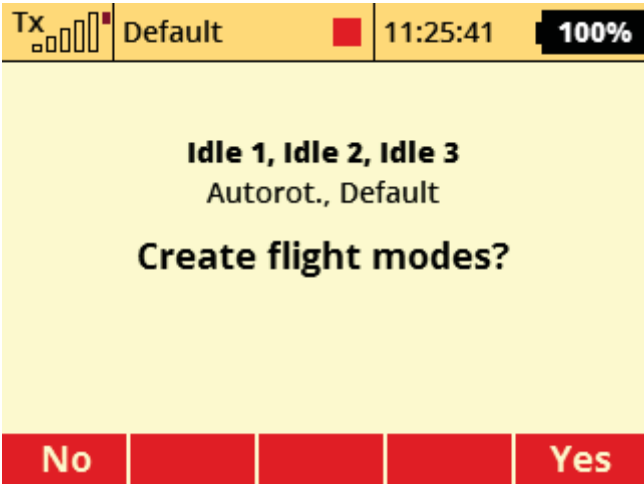
## 4 Basic Helicopter settings

Open **Heli Tuning** menu - Main Menu/Heli Tuning.

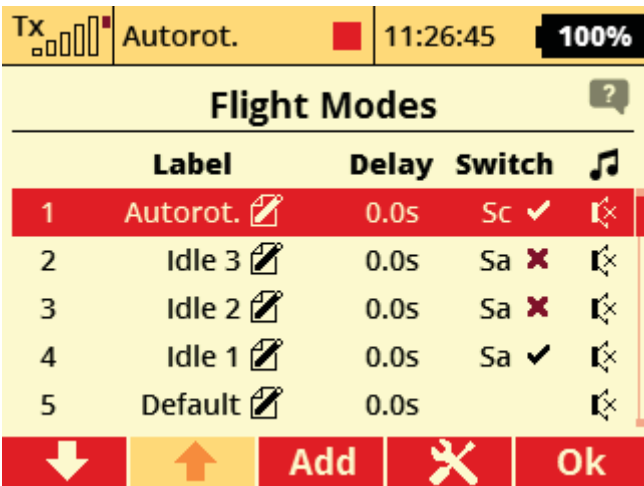


### 4.1 Flight Modes

Enter Flight Modes menu and press Yes when prompted "Created flight modes?".



Assign switch for Autorot. mode - usually it is two-state switch called **Sc** at the left front side of the radio. This switch will be used for Throttle Hold/Autorotation. Also assign switch for all Idle modes - usually it is tri-state switch called **Sa** above Sc.



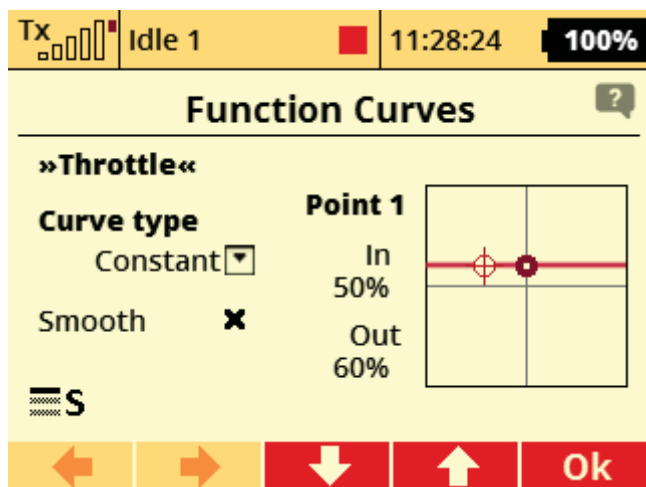
**i** Non-Spirit Jeti radio might need to get extension module for Flight modes (from [swshop.jetimodel.com](http://swshop.jetimodel.com)). Alternatively you can use only 3 Flight modes.

**i** Instead of Autorot. flight mode you can set Throttle Cut switch.

## 4.2 Throttle Curve

Open **Throttle curve** menu - Main Menu/Heli Tuning/Throttle curve.

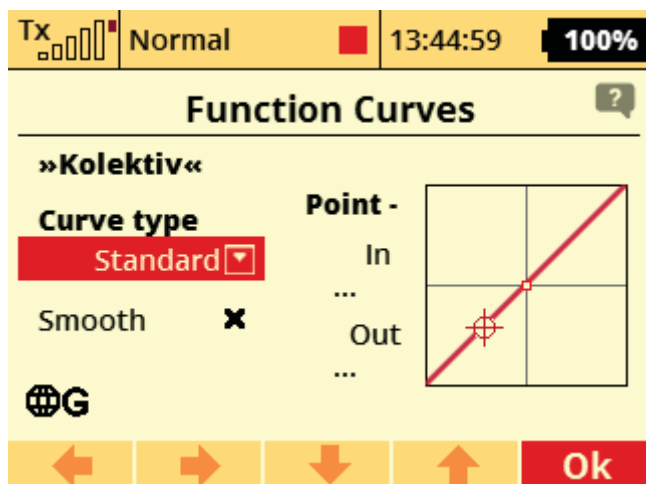
Disarm Throttle Hold and set Throttle curves for all Idle Modes. When you switch Idle modes, curves will change accordingly. For more advanced pilots it is recommended to set Curve type to Constant - especially when you are using Governor.



## 4.3 Pitch Curve

Open **Pitch curve** menu - Main Menu/Heli Tuning/Pitch curve.

In a similar way set Pitch curve - in the most cases no changes are required. It is preconfigured to -100 to 100% linear curve. For beginners Pitch curve such as -20 to 100% is more suitable.



## 4.4 Gyro Gain

Open **Gyro Settings** menu - Main Menu/Heli Tuning/Gyro Settings. By default it assigned to tri-state **Se** switch. Values are 50%, 0%, -50%.

For the beginning you can use these values. Positive value will activate **Head-Lock** Gyro mode, while a negative value will engage **Normal (Rate)** mode.

For further Gyro Gain tuning you can set 50, 60, 70% gains or assign a potentiometer.

Tx

Normal

13:43:10

100%

Gyro Se

Press Menu for help

?

Position 2

Tuning

[Gyro gain]

60%( 60)

...0%G

Ok

# SpiritRS Mounting

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## 1 Unit Mounting

Correct mounting of the Spirit RS unit plays an important role for the operation of your model.

Find a suitable location where vibrations are as low as possible - this is usually the same location shown by the manufacturer for mounting a gyro.

It is VERY important that the unit will be mounted so that the unit is **exactly** perpendicular to each rotational axis. Depending on your preference and available space it can be mounted in eight different positions:

- Horizontal ( $0^\circ$ )
- Horizontal ( $180^\circ$ )
- Horizontal ( $0^\circ$  + inverted)
- Horizontal ( $180^\circ$  + inverted)
- Vertical ( $0^\circ$  - left side)
- Vertical ( $180^\circ$  - left side)
- Vertical ( $0^\circ$  - right side)
- Vertical ( $180^\circ$  - right side)

In case the unit is positioned so that connectors are facing forwards, select  $180^\circ$ , please. If the unit is mounted upside down, select *inverted* option.

### Mounting examples

In the following photo the unit is mounted by double-sided adhesive tape to the frame of model.



*Example 1:* Position is **Horizontal ( $180^\circ$ )**



*Example 2: Position is **Vertical (180° - left side)***


In order to better insulate against any vibrations from the model, it is necessary to choose the right double-sided mounting tape. The tape should limit any transmission of vibrations from the model to the Spirit which may produce undesirable flight characteristics. Vibrations may also be caused by incorrectly balanced blades, damaged bearings, bent shafts and other mechanical issues.


We recommend to use supplied double sided tape.

## 2 Antenna

Spirit RS is equipped with 2 full-range antennas. For the best signal reception it is necessary to mount them properly at the model.

Ideally ends of the antennas should be perpendicular to each other in all directions.

 **Do not bend antennas more than 45° in a sharp angle. Bending radius should be more than 2 cm.**

 **Do not cover antennas with any additional objects. Preferably direct visibility at any angle should be achieved.**

# SpiritRS Wiring

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Spirit RS with the current firmware has support for 3x swashplate, 1x tail and 1x throttle servos. It has also 2x independent DUPLEX telemetry ports which mean you can attach directly two JETI sensors. Moreover you can optionally connect a backup receiver.

Additionally you can utilize ESC telemetry.



## Contents

- 1 Servo Wiring
  - 1.1 Elevator at the front
  - 1.2 Elevator at the rear
- 2 Power Supply

# 1 Servo Wiring

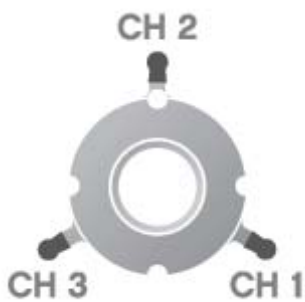
According following diagrams you can connect servos to the Spirit RS. If some of your servos are not 1520μs center pulse, please connect the servo later during Setup Wizard process.

- **CH1** and **CH3** - Aileron/Pitch servo
- **CH2** - Elevator Servo
- **CH4** - Tail Servo

Depending on your model and selected Swashplate Type servos are wired differently. Wiring is described in the following sections and also in the Setup Wizard.

## 1.1 Elevator at the front

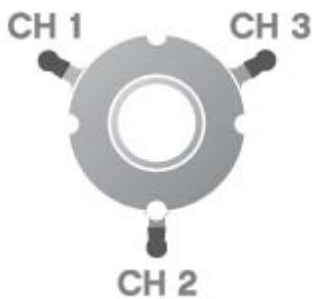
Elevator has servo control push rod at the front part of the model - swashplate push rod at the front.



- **CH1** - connected to the right servo (Pitch)
- **CH3** - connected to the left servo (Aileron)

## 1.2 Elevator at the rear

Elevator has servo control push rod at the rear - swashplate push rod at the rear.




- **CH1** - connected to the left servo (Aileron)
- **CH3** - connected to the right servo (Pitch)

## 2 Power Supply

Power Supply is critical part of the model. For this reason it is highly recommended to use suitable BEC or battery that can handle used servos. Once wiring and setup is completed it is highly advised to perform the **BEC test**. If the test will not pass it is clear the power supply is inadequate and failure will occur.

BEC, Battery or Backup power supply should be connected always at **THR**, **E1** and **AUX** ports.

- **THR** - used for Throttle output and primary ESC/BEC cable for electric helicopters. For a combustion helicopters THR port is used for Throttle Servo.
- **E1** - used for Secondary BEC cable for electric helicopters (recommended for class 500+). For a combustion helicopters E1 port is used for a Battery lead.
- **AUX** - used for Optional Power Guard system or an additional battery lead. Can output also channel data for controlling a landing gear, lights, etc.

 **Do not connect any wire to E2 pin. This pin is shared between Spirit and internal receiver. It is used for future purposes. Improper utilization of the E2 pin can result in loss of control!**

# SpiritRS Telemetry

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Spirit RS is equipped with 2 separate inputs for JETI model sensors. These sensors are completely compatible and can be used in the same way as with REX-line receivers.

If you will need to connect more sensors, you can use **JETI model EXPANDER**. So you are able to virtually connect up to 8 telemetry sensors at the same time.

Available telemetry ports:

- **E1**
- **EXT**

By default both are configured as JETIBOX/Sensor which mean you do not have to do any other adjustments, just connect the sensors.

Spirit RS is equipped also with E2 port. In the future this port can be used in case Spirit RS will act as a standalone receiver. No sensor for Spirit RS can be connected there.

## Contents

- 1 Telemetry Sensor Wiring
  - 1.1 E1 port
  - 1.2 EXT port
- 2 Telemetry Sensor Data
- 3 Spirit Telemetry
  - 3.1 List of supported ESCs

# 1 Telemetry Sensor Wiring

## 1.1 E1 port

Connect Sensor or Expander cable directly without any change.



This port can be used for a sensors that require JETIBOX/Sensor or EXBUS configuration. Spirit RS can be also used as a standalone receiver while using this port.

## 1.2 EXT port

Connect Sensor or Expander cable in so that RED/BROWN wires are at the AUX port (or any other free powering port) and ORANGE wire at the EXT pin. In case of lack of free ports, please use an Y-cable.

**i** Original connector must be modified so that two servo connectors are used. You can use JETI integration cable for this purpose.



This port can be used for a sensors that require JETIBOX/Sensor configuration. EXBUS settings is not possible there.

## 2 Telemetry Sensor Data

You can set display Sensor Data at the Main screen in the **Displayed Telemetry** menu.

Tx

Autorot.

10:45:05

100%

Displayed Telemetry

1

S Vibes [%]

No

2

S RPM

No

3

Voltage Rx

No

4

Model Time

Yes

Add

Del.

Ok

Tx

Autorot.

10:45:21

100%

S Vibes

0%

S RPM

0

Spirit test

Off

Page 1/1

Voltage Rx

5.54V

Model Time

0:19:50

Start

Clr

## 3 Spirit Telemetry

Besides JETI model sensors you can also utilize the ESC Telemetry and Spirit telemetry variables.

So that you can interface your ESC and display telemetry data such as Battery Voltage, Current, Consumed Capacity, Temperature, RPM.

### 3.1 List of supported ESCs

- Castle Creations Phoenix & Talon
- HobbyWing Platinum V4
- Scorpion Tribunus
- Kontronik KOSMIK & JIVE PRO
- Kontronik JIVE
- YGE LVT/HVT
- Kontronik TelMe Telemetry

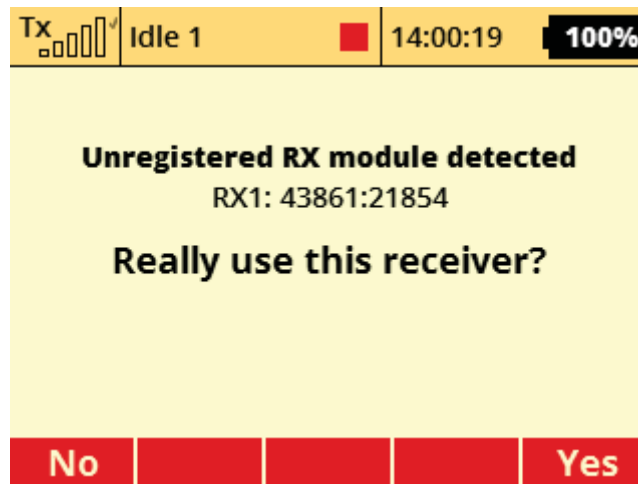
# SpiritRS Binding

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## 1 Binding Procedure

In order to Bind Spirit RS with your radio use supplied Bind plug.

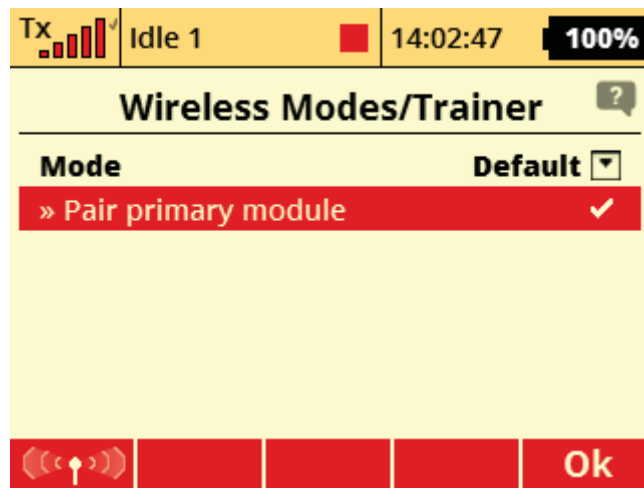
1. Insert Bind plug in the SYS port and connect Power supply to the Spirit unit. (For example ESC/BEC at the THR port)
2. Spirit unit will start to blink with the Status LED periodically.
3. Then power up your radio.
4. Radio will ask if you wish to use the receiver. Confirm by pressing Yes button.



### 1.1 Not recognized by radio

In case you already bound a receiver or Spirit RS with selected Model profile, you might need to start Binding process again.

Go to Model/Heli Tuning and press middle button under display. Then select **Pair primary module**.



Subsequently you can Turn Off and Turn On your radio. During powering new receiver should be recognized. Once correctly bound with Spirit RS you should see full Tx signal in the top left corner at the display.

# SpiritRS Setup


All Spirit units can be configured through radio in the full extent without usage of computer. You can perform full setup of the Spirit RS and tune all flight parameters easily in **Device Explorer** menu.

## Contents

- 1 Spirit Integration
  - 1.1 Opening Spirit menu
  - 1.2 Spirit Settings
  - 1.3 Closing Spirit menu
- 2 Configuring Receiver part
- 3 Spirit RS setup

## 1 Spirit Integration

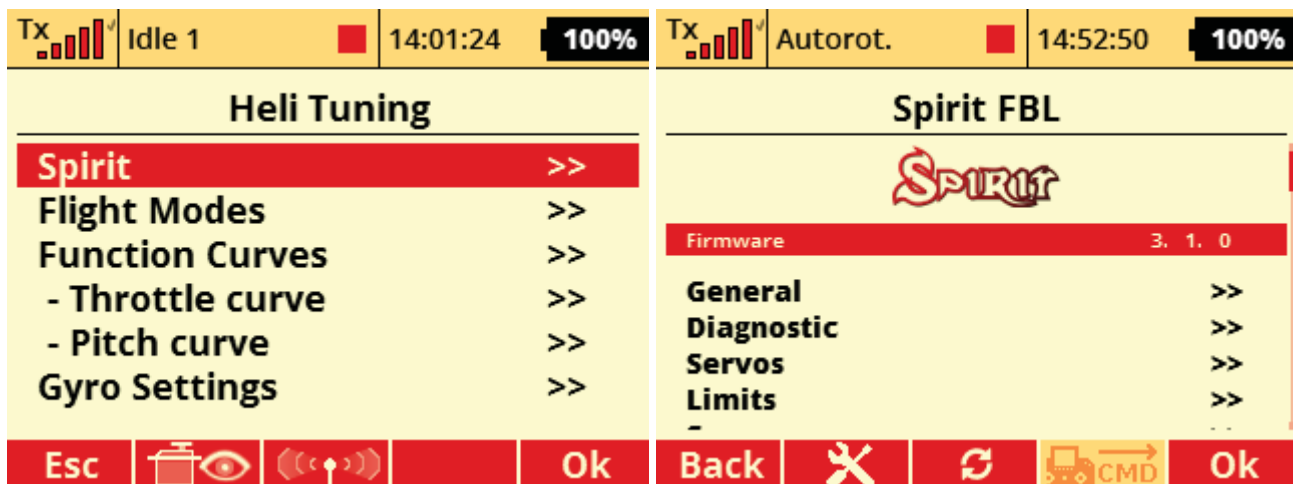
Spirit Integration is interface for configuration of the Spirit unit. All changes related to the Spirit RS can be done from there. You can enter and close it anytime you wish.


 It is highly advised to not enter the setup while flying! If you were performing changes in this menu, always close it according section Closing Spirit menu.

### 1.1 Opening Spirit menu

To open Spirit setup you can proceed in the following way.

Open **Spirit menu** in the Model/Heli Tuning.




 In case you are getting error message when opening the integration menu, **please install the latest JETI integration file** - available at our web pages.  
SPIRIT-3.X.zip archive must be extracted and all the files copied to the Devices directory inside your Radio.

## 1.2 Spirit Settings

Spirit menu is almost identical to computer software called Spirit Settings that can be also optionally used.

You can easily change any parameter and changes are applied immediately. But to store any changes do not forget to Save the settings.

 Click at the **Save Settings** in the Spirit menu to save all changes you have made in the Spirit RS settings. Otherwise after re-power changes are returned to the previous values.

## 1.3 Closing Spirit menu

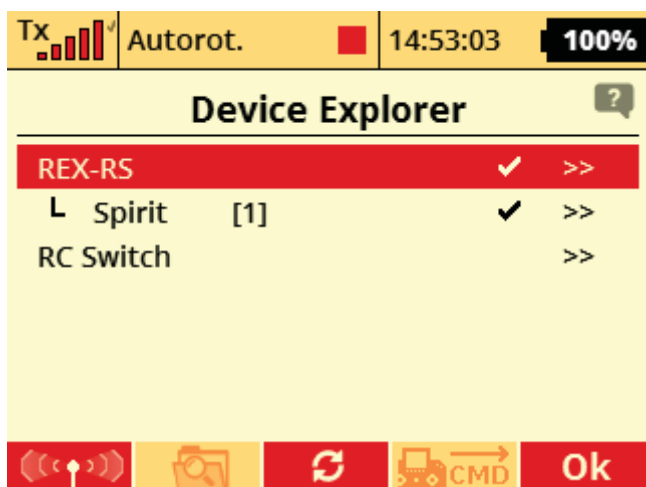
To continue with flying please close the Spirit menu by selecting **Close the integration menu**. Once this is performed, Status LED of the unit must remain steady On.

## 2 Configuring Receiver part

To configure E1 telemetry port you can open **Device Explorer** and perform settings there.

Open Menu and press right button under display. This will open Device Explorer instantly. Alternatively you can go through Model/Device Explorer menu.

Then select **REX-RS** device. All changes in the settings are saved immediately.



## 3 Spirit RS setup

To prepare Spirit unit for flight it is necessary to go through **Setup Wizard** first. This process is required only once, always for a new model.

You can find the Setup Wizard in the Spirit Integration menu.

## Setup Wizard

<< Back

Welcome to the Setup Wizard!  
You will be guided through the entire setup  
After finishing the Wizard your model will be ready to fly.  
You will need Pitch Gauge and Cyclic Leveler.

Firstly, unassemble Main Rotor head.

If you are ready to begin, please continue.

**Mounting Position**

>>

Back



Ok

## Mounting Position

Position

Horizontal (180°) 



If unit is mounted continue to the following step.

Back



Ok

# SpiritRS Computer

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Spirit RS units can be configured basically through any modern computer. This will allow the best comfort and guidance through the entire setup process.

Spirit RS is compatible with Spirit USB interface and can be connected and configured at any given moment.

Please proceed according our Configuration page that is common for all Spirit units.



**i** For configuration of the GeoLink module it is necessary to use this software.

# SpiritRS FCC

## FCC Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**CAUTION:** The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with the FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.