COMPLEX RADIO CONTROL SYSTEM

JETI model®

duplex

EN User Manual

Receivers REX

ASSIST

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REX Receivers with Assist Functions

1 Introduction ENGLISH

The REX A receivers enhance the REX series of receivers and extend it with the intelligent flight stabilization feature, which is designed for airplane models and multicopters. This stabilization works in all three axes of the model and facilitates flying in windy or otherwise challenging conditions. Aerobatic maneuvers will be more accurate and smoother. With the help of several flight modes, which are also suitable for beginner pilots, flying practice will be really easy.
The REX A receivers are compatible with all existing 2.4GHz Duplex Tx modules and DC/DS transmitters.
You can set them directly via DC/DS transmitters, alternatively you can use the USBa adapter and JETI Studio software (free download at www.jetimodel.com). The receivers provide internal telemetry (e.g., receiver quality, inertial unit status and G-force level). They also process telemetry from external sensors compatible with Duplex EX or EX Bus.

In order to stabilize the airplane model effectively in flight, it is appropriate to equip the model with high speed digital servos. Stabilization is also suitable for helicopters and engine models.

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The JETI model company portfolio contains a diverse offering of electronic modelling equipment like voltage regulators, motor speed controllers, telemetry data display equipment, telemetry sensors and, last but not least, DC/DS transmitters. The JETI model product manfacturing policy is to constantly produce the highest quality product possible.

2 Technical data

Basic Data	REX6A	REX7A	REX10A	REX12A*
Dimensions [mm]	38x25x11	42x28x11	51x28x11	51x28x11
Weight [g]	11	13	16	24
Antenna length [mm]	2x100	2x200	2x200	2x400
# of channel outputs	6	7	10	12
Temperature range [°C]	-10 to +85	-10 to +85	-10 to +85	-10 to +85
Supply voltage [V]	3.5 – 8.4	3.5 – 8.4	3.5 – 8.4	3.5 – 8.4
Average current [mA]	80	80	80	80
Real time transmission of telemetry data	Yes	Yes	Yes	Yes
Programming	Tx - DC/DS	Tx - DC/DS	Tx - DC/DS	Tx - DC/DS
Support satellite receiver Rsat	Yes	Yes	Yes	Yes
Power output [dBm]	15	15	15	15
Receiver sensitivity [dBm]	-106	-106	-106	-106
Frequency [MHz]	2400 - 2483	2400 - 2483	2400 - 2483	2400 - 2483
Built-in sensors	3-axis gyroscope, 3-axis accelerometer			
Sensitivity of altitude measurement	0,1m			
Range of gyroscope measurement	± 2000°/s			
Range of accelerometer measurement	± 16G			
Gyroscope/accelerometer sampling rate	6600Hz			

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* External Power Connector

2.1 Properties

- Up to 16 stabilized airplane channels.
- Support for different multicopter types – from tricopters to octocopters.
- Up to 3 adjustable flight modes, options for stabilizing the horizon and altitude.
- In-flight gain tuning using free channels.
- Using the latest 3-axis gyroscope and 3-axis accelerometer.
- Support for LED strip consisting of WS2812 chips.
- Support for external camera gimbal driven by servos.
- Intelligent fail-safe.
- Vibration analysis.
- Full set-up options with DC/DS transmitters or via PC.
- Available telemetry: Receiver voltage, signal quality, G-force, attitude orientation.
- Support of telemetry and up to 3 sensors connected directly.

2.2 Important Notices

- Always use the current firmware in your DC/DS transmitter and receiver. The minimum version of software for transmitters supporting REX A receivers is 4.24.
- Always check the polarity of the lead wires so that the voltages on the receiver and other electronics are not reversed.
- Do not expose the receiver to heat and sudden temperature changes that may affect the accuracy of the sensors.
- Never use a receiver that is visibly damaged. In particular, check the state of the antennas regularly. In no way modify or remove the receiver electronics from the supplied housing.
- When installing on accessories in the model, keep in mind

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that all electronics must be optically isolated from the ignition unit and ideally located as far as physically possible from the engine itself.

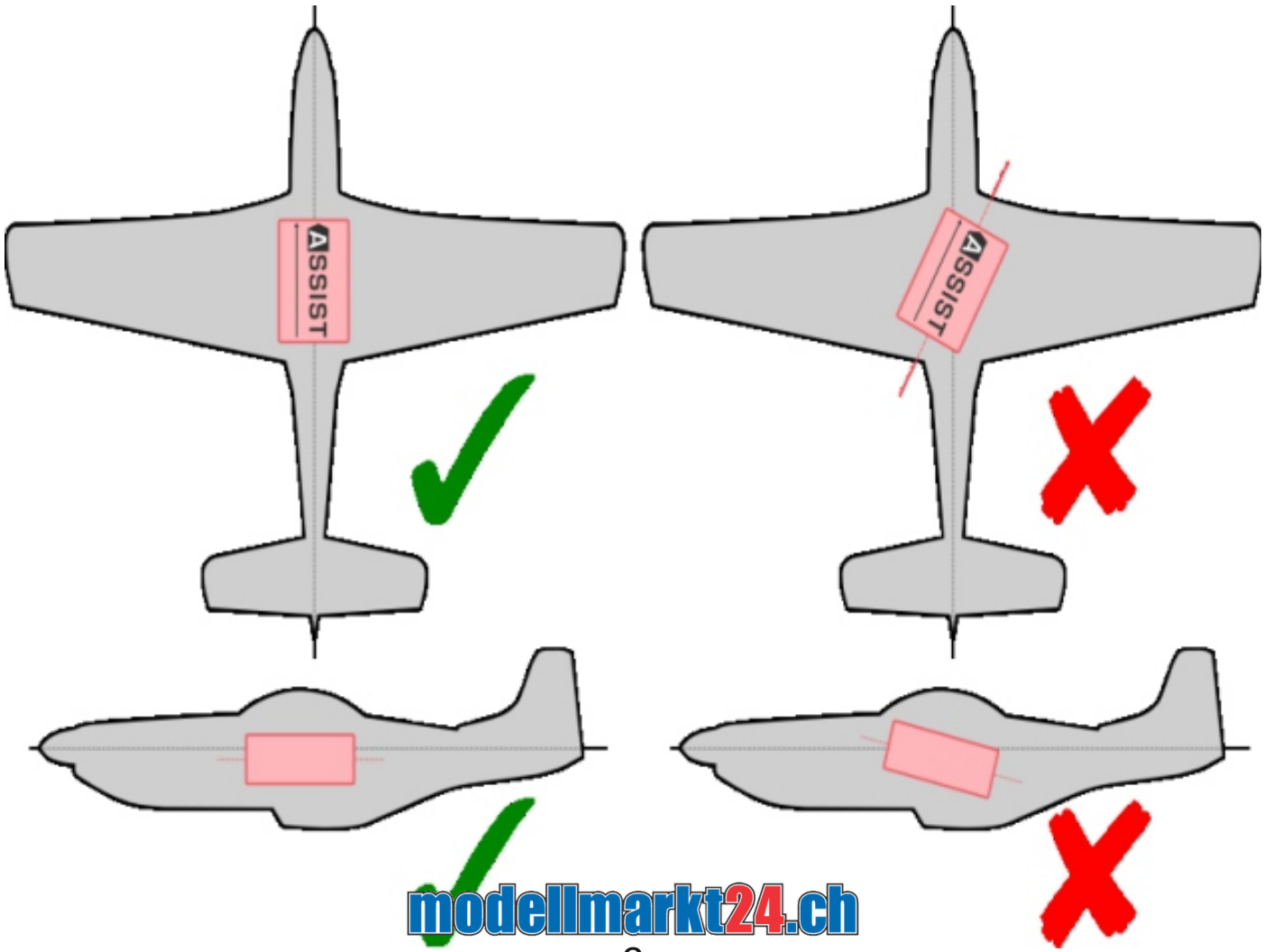
- Do not expose the receiver to excessive vibration. Sensors in the receiver are very sensitive and vibrations are an undesirable phenomenon. It is advisable to check the vibration level with the built-in analyzer before flight and to take appropriate measures to reduce vibration (e.g. attach the receiver in the model with a soft double-sided adhesive tape).
- Do not expose the receiver to direct air flow. Aerodynamic forces may have a strong influence on the sensitive barometric sensor when the model is moving faster.
- Always use a sufficiently sized power source for the receiver and servos. Keep in mind that with the stabilization switched on, the servos in the airplane model are constantly moving, resulting in increased current consumption and subsequent heating of the components.
- Any major changes to the settings (especially for the initial configuration) should be done without the propellers fitted.
- During use, it is recommended to switch on the transmitter first and then the receiver. The transmitter confirms that the receiver is turned on by an acoustic signal. When turning off the system, first switch off the receiver and then the transmitter.
- REX A receivers do not support Clone mode. This is because the stabilizing receiver should always be the primary receiver in the model. Other receivers, serving as satellites, must not have the stabilization enabled.

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3 Installation

3.1 Installation in the model

Always place the receiver in the model parallel to the flight axes and ideally as close as possible to the center of gravity (especially for multicopters). This is important for the proper functioning of stabilization and its correct response. It is important that the mounting of the receiver is made in such a way that the vibrations from the model are minimized and that the fixation is guaranteed at the right place. We recommend using a double-sided adhesive tape for this purpose.

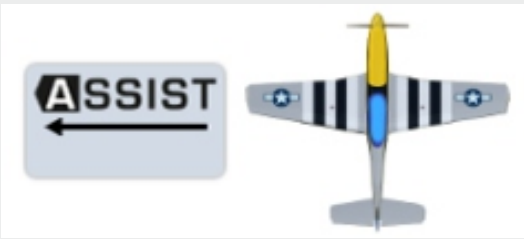


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There are several ways to place the receiver in the model, and you need to activate this position in the setup wizard. The direction of the arrow on the receiver sticker determines its placement:



Default - Horizontal



Rotated by 90°



Vertical – on the left



Vertical – on the right



Inverted - Horizontal



Standing – on the left



Standing – on the right



Rotated by 180°

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3.2 Power supply

When designing a wiring system in the model, always be careful about choosing a suitable power supply so that it is sufficiently current-rated and its output voltage is compatible with the receiver, servos and other electronics. It is recommended that the REX A receivers be powered by low-resistance Li-XXX type batteries or a stabilized BEC voltage source (either as a separate device or integrated in the speed controller).

Never connect two different voltage sources in parallel, even if they seem to have the same parameters. Instead, use an additional circuit, such as DSM10, to separate both sources which become independent.

The supply voltage can be applied to the receiver in the following ways:

- *Via throttle channel (when using the speed controller BEC).*
- *Using any free or open receiver port.*
- *Via the MPX connector included on EPC receivers (Extended Power Connector).*

For multirotors, use either a BEC output from a single controller or, in case of Opto-type controllers, use an external stabilized source. Never connect voltages from several BEC circuits in parallel.

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3.3 Operation

We recommend that you switch on the transmitter first and then subsequently the receiver. The transmitter confirms the switching-on of the receiver with an acoustic signal. When switching off the system we recommend that you switch off the receiver first and then subsequently proceed with switching-off the transmitter.

3.4 Binding

When using a new receiver or transmitter it is necessary to carry out the binding process between them. Transmission between the receiver and transmitter occurs in fully digital manner, therefore it is necessary to identify and share the addresses of each device communicating on the mutual 2.4GHz frequency band.

Procedure:

1. *Insert the **BIND PLUG** (included in the receiver packing) into the receiver socket labeled Ext.*
2. ***Switch on the receiver** – (connect a proper voltage supply to the receiver). Binding of the receiver may now be performed within 60 seconds. After the 60 seconds elapse the receiver returns to setup mode and the binding process must be repeated by starting again from step 1.*
3. ***Switch on the transmitter** - the transmitter emits an acoustic signal announcing the detection of a new receiver.*

Binding may be carried out with the aid of the JETIBOX instead of using the BIND PLUG.

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The procedure is as follows:

1. ***Connect the JETIBOX*** *with the connecting cable to the Ext. receiver output.*
2. ***Switch on the receiver*** *- (connect a proper voltage supply to the receiver).*
3. *The receiver menu appears on the JETIBOX display.* ***Select the „Pairing“*** *menu item (push the right arrow button once from the main receiver display) and then push the upward button. You now have a period of 60 seconds to bind the receiver. After the 60 seconds elapse the receiver returns to setup mode and the binding process must be repeated by starting again from step 3.*

If the binding process between receiver and transmitter was unsuccessful, try again.

You may bind an arbitrary number of receivers to one transmitter. The receiver, however, can only be bound to one transmitter, i. e. the receiver is only bound to the most recently bound transmitter.

3.5 Range test

By range testing, you verify the correct operation of the transmitter and receiver. You should perform a range test before your first flight of each flight day, or if there are any doubts about the function of the transmitter or receiver. In the range test mode, the transmit power is reduced to 10%. When testing range, place both the model and transmitter at a height of at least 80cm (3ft) from the ground. A properly operating transmitter and receiver should reliably control the model at a distance of at least 50 meters (or 50 yards) in the test

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mode. If this is not the case, be sure to check the correct installation of the receiver antennas. If the test is not successful afterwards then do not use the device and contact your dealer or one of our service centers.

Setting into Range Test mode:

- Insert the pairing jumper (BIND PLUG) into the Ext. port of the receiver, turn on the receiver and then the transmitter. Range test mode will be active for as long as the bind plug is inserted in the Ext. port.

- Alternatively, you can run the range test in the DC/DS transmitter via the System – Servo & Range Test menu.

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4 Quick Setup

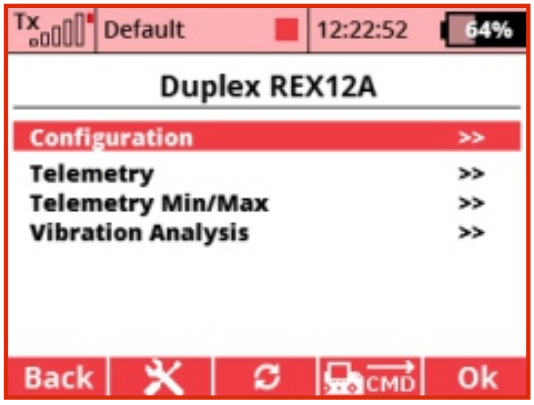
4.1 Airplane

From production the REX Assist receivers behave as standard receivers and stabilization is not active by default. This can be used to set up an airplane model - the initial procedure is similar:

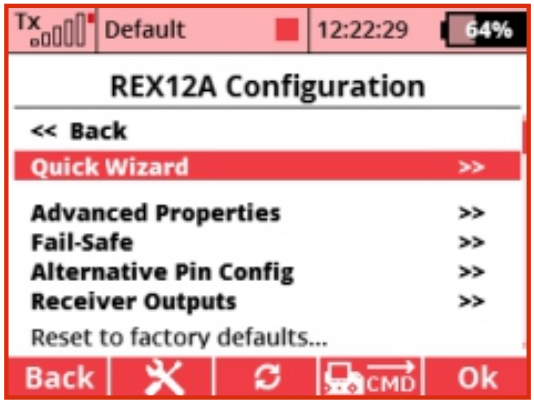
1. Place the receiver in the model according to the ***"Installation in the model"*** chapter.
2. Create a new model in the transmitter as usual. The individual channels of the transmitter should correspond with the outputs on the receiver. If you plan to use additional channels to tune the stabilization gain or to switch flight modes, this is the moment you should create them. By doing that you won't have to go back to your channel settings while configuring the receiver via Quick Wizard menu. More information about the auxiliary channels can be found in the Additional channels section.
3. Pair the transmitter with the receiver.
4. For the model, set its subtrims, dual rates and expos according to the recommended values. Do not set up advanced mixes or change the servo path using servo balancer.
5. Now go to the receiver configuration – either through the **DC/DS** menu **a)** (***Model -> Device Explorer***) or via your PC (***see chapter Configuring the Receiver with PC***).
6. Run the stabilization setup wizard **b)** (***Configuration -> Quick Wizard***) . On the first screen, enter the ***"Airplane Assist"*** option **c)** and go to the next page with the **"Next"** link.

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a)



b)

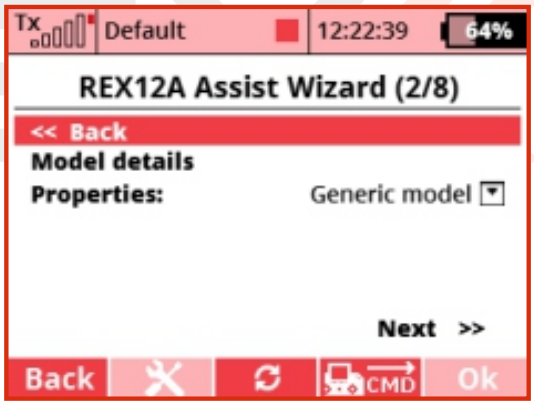


7. Specify the model type so that its flight characteristics best match one of the options **d), e)**. Several types of gliders, aerobatic models and others are available. Each model type includes preconfigured and optimized stabilization presets so that the first flights are enjoyable and the additional settings are kept to a minimum.

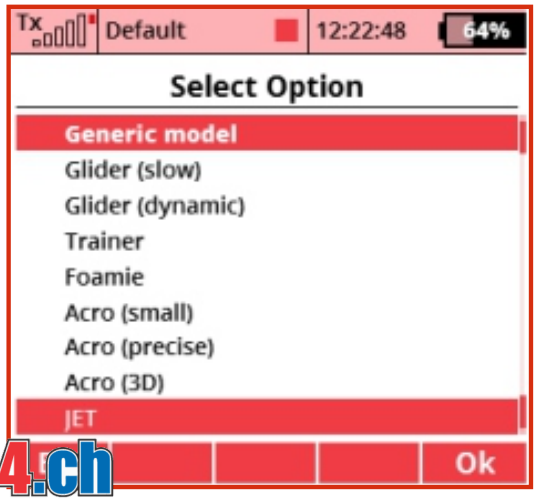
c)



d)



8. In the next step, select the receiver position in the model so that the displayed graphics matches real situation **f)**. A total of 8 options are available *(see chapter Installation the model)*. Illustration indicates flight direction.



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9. Now check for additional features **g)**:



f)



g)

- **Use airspeed correction** – if the model is able to move at a large range of speeds, it is advisable to supplement it with the ***MSPEED*** sensor or ***MGPS*** for measuring flight speeds. By activating this field, the receiver will take into account the current speed while performing stabilization.
- **Use camera gimbal** - by checking, you enable the function of an external servo control for camera gimbal.
- **All servos digital** - This option specifies the servo output period. If all the servos are digital in the model, the output period will be automatically set to 7.5ms. Otherwise, it will be 17.5ms.

10. Assign the individual channels for stabilization so that the receiver learns neutral positions and throws of individual servos **h)**. The model can now be placed arbitrarily because at this point you only calibrate the control functions. Proceed step by step according to the wizard and calibrate only the axes that will be

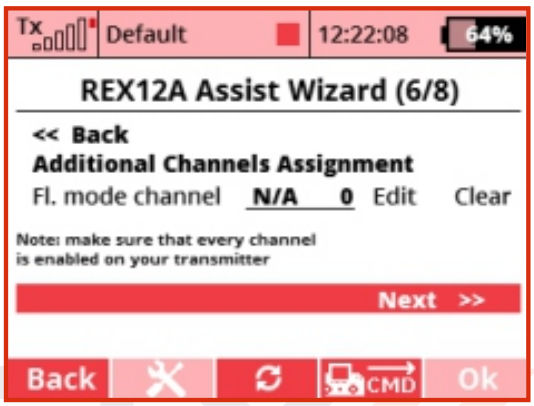


h)

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used during stabilization. Check the correct response to the controls by looking at values displayed in the ***"Controls"*** row. If the servos in the model are not moving, it is ok at this point - the receiver will not allow servo outputs until the configuration is completed.

11. Assign a channel for switching flight stabilization modes **f)**. This channel should be controlled by a three- position switch, so that all three flight modes are available. In position **1,** the stabilization is disabled by default. Switching to position **2** (center) activates the ***"Normal"*** mode. Switching to position **3** activates the ***"Heading Hold"*** mode.



i)

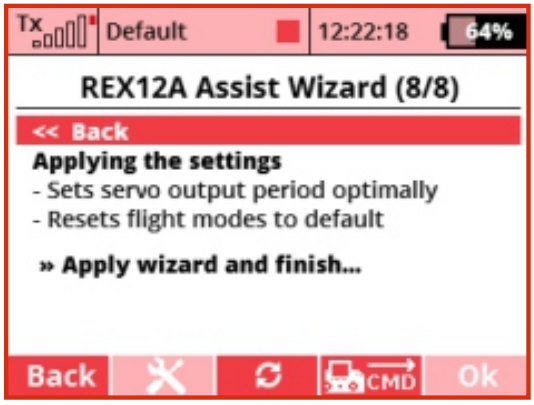
Note: First add a three-position switch to your DC/DS transmitter as a new function in the Model – Functions Assignment menu. Then assign this option to a free channel in the Model – Servo Assignment menu. Subsequently, this three-position switch can be used here in the receiver setup wizard.

12. If you have selected the ***"Use gimbal"*** option in the previous steps, assign the individual channels to the gimbal control. You can skip this point and configure the camera gimbal later in the ***Configuration -> Channel Assignment -> Gimbal channels***.

13. Finish the wizard and application settings **j)**. When you run the

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"Apply wizard and finish" command, you store the parameters in the receiver and the stabilization is reset to the mode according to data you've entered.
Attention: *At this point, the settings of individual servo outputs, flight mode configuration, and the PID control gains will be reset.*



j)



k)

14. Before each flight, place the model on the ground and hold it stable during the gyroscope initialization. Once the initialization is completed, it is possible to move servos.

15. Check for correct input control response and stabilization function when moving in each axis. For example, if you rotate the model to the left, the control surfaces should tend to move in the opposite direction.

16. Perform the first flight either with stabilization disabled (manual mode) or in **"Normal"** mode. If the model does not fly straight, trim it and then land. Re-assign the primary channels. Continue to optimize the settings so that the flight characteristics of the model match your preferences.

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4.1.1 Airplane model settings optimization



In the ***"Airplane Settings"*** menu in the REX A configuration you can fine- tune the stabilization gains for individual axes.

Gain - This parameter determines the proportional rate of model stabilization in flight. If the model is insufficiently stabilized, for example in wind gusts, increase the gain each time by 20% until the model starts to oscillate. Consequently, reduce your value by 20%. Try the new settings at different flight speeds and make sure that even at high speeds there are no oscillations.

Heading - Determines how intensively the model keeps its orientation and direction in the ***"Heading Hold"*** mode. In ***"Normal"*** mode, this parameter is not used. You can test the function of heading hold function, for example, when you are in knife edge flight.

3D Aerobatic Factor (Stick Priority) - Determines how the stabilization gain decreases depending on how the control stick moves from the center position. For instance, a 60% aileron stick priority means that at maximum left or right, the aileron gain will be reduced to 40% and the stick direct position will be applied from 60%.

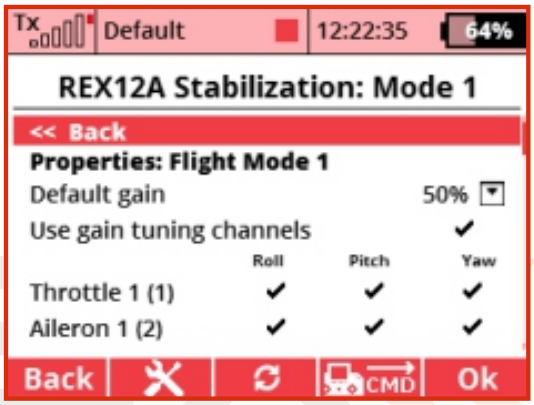
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4.1.2 Choice of flight modes



Depending on your preferences, choose which flight modes to use during flight - a total of 5 modes are available, allowing you to switch between three in flight (see Description of flight modes section).

Specify the **Fail-Safe** mode: In Intelligent mode, the receiver will stabilize the model in horizontal position. On the other hand, selecting ***"Assist Off"*** will apply preset servos positions, or the last known position will be retained (***see the Configuration – Fail-Safe menu for more details***).



For each Flight mode, you can set the default gain (this multiplies the stabilization gain and the heading-hold ability in all axes). You can also specify whether to use the gain tuning via special dedicated channels (see ***Configuration - Channel Assignment - Assign Additional Channels***).

For each flight mode, it is also possible to specify which servos are stabilized by which function. By default every combination of functions is allowed. If you do not need to have e.g. a stabilized rudder in all flight modes, simply deactivate it in the appropriate line.

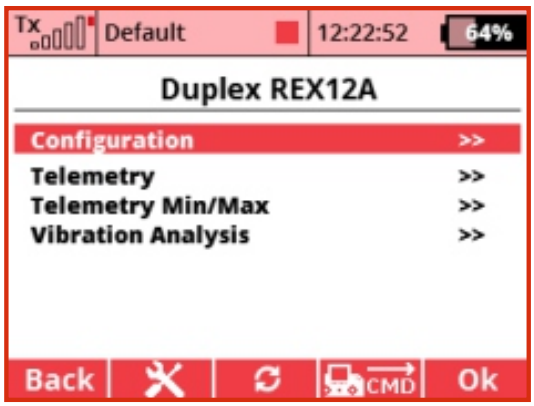
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4.2 Multicopter

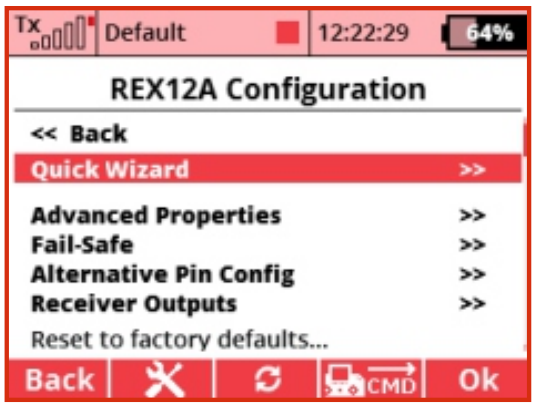
Before you connect and configure the REX A receiver for the first time in a multicopter model, we recommend disconnecting speed controllers with motors from the receiver to avoid accidental spinning.

1. Remove the propellers from motors.
2. Place the receiver in the model according to the **Installation in the model** chapter.
3. In the transmitter, create a new multicopter model. When setting up, make sure that ***Motor/Throttle***, ***Aileron/Roll***, ***Elevator/Pitch***, ***Rudder/Yaw*** and ***Flight-Mode*** switching functions are operated separately on each channel.
4. Pair the transmitter with the receiver.
5. Navigate to the receiver settings either via the **DC/DS** menu **a)** (***Model -> Device Explorer***) or via USB adapter and JETI Studio.
6. Run the stabilization setup wizard **b)** (***Configuration -> Quick Wizard***). On the first screen, enter the ***"Multicopter Assist"*** option.

a)

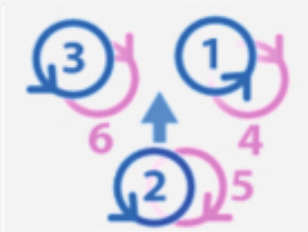


b)



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7. Select the type of your multicopter frame **c) d)** and continue to the next page by pressing the **"Next"** link. The following types of frames are supported (direction of rotation and motor sequence must always be observed):

 **Tricopter Y**	 **Quadcopter +**
 **Quadcopter X**	 **Hexacopter +**
 **Hexacopter X**	 **Hexacopter Y**
 **Octocopter + (REX10 A or REX12A)**	 **Octocopter X (REX10 A or REX12 A)**

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c)

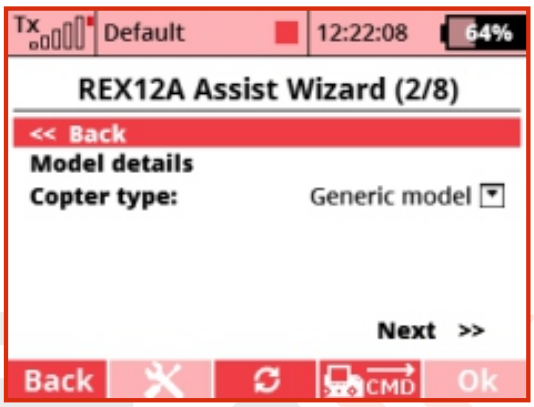


d)



8. On the next screen **e)**, select the multicopter characteristics to best match your model. Each type includes preconfigured and optimized presets for stabilization so that the first flights are enjoyable and additional settings are kept to a minimum.

e)



9. In the next step **f)**, select the receiver position in the model so that the displayed graphics matches real situation. A total of 8 options are available (see chapter Installation in the model). The illustration indicates flight direction.

f)



10. Now check for additional features **g)**:

- **Use camera gimbal** - by checking this option, you enable the function of the external servo-controlled camera gimbal.
- **All servos dig** [illegible] es the output period

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for servos that are used as additional channels. If all the servos in the model are digital, the output period will be automatically set to 7.5ms. Otherwise, it will be 17.5ms. The output control period for the motors is 2.5 ms, which means 400Hz.



g)

- **Use OneShot125** - by checking this option, you enable the OneShot125 mode to control the multicopter speed controllers. This is a special mode where the pulses from the receiver are eight times shorter than the standard servo pulses. OneShot125 must also be supported on the controllers side.
- **Always stabilize motors** - after activating this option, the multicopter will be stabilized from the moment of arming and the first throttle application until switching off the motors. Stabilization will always work, even with throttle at idle position. This option is not recommended for first flights with a multicopter.

11. Assign the individual channels for stabilization so that the receiver learns neutral positions and channel throws **h)**. Follow the step by step guide. Calibrate all axes sequentially one by one. Check correct responses to the controls by the values displayed in the **"Controls"** row.

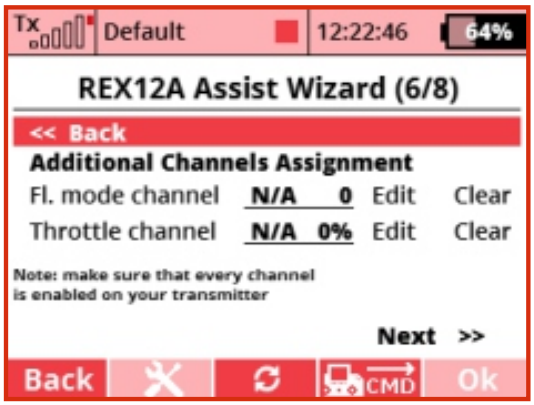


h)

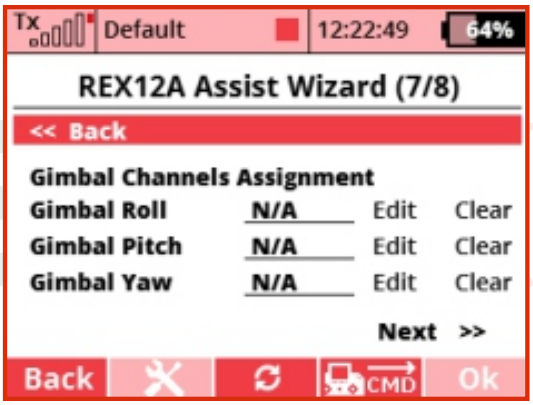
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12. Assign a channel for switching flight stabilization modes. This channel should be operated by a three- position switch, so that all three flight modes should be available. In **position 1** the altitude and horizon stabilization is enabled by default. Switching to **position 2** (center), a simple horizon stabilization mode with direct throttle is activated. Switching to **position 3** activates the aerobatics mode.

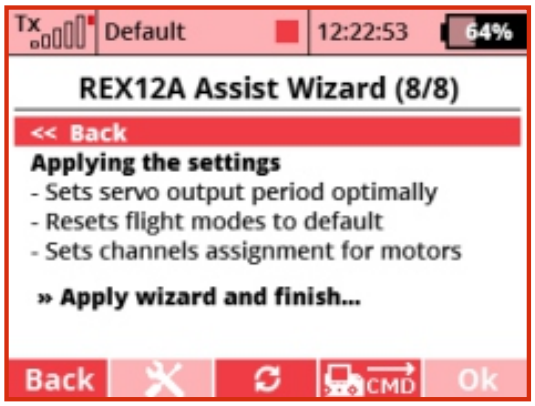
Assign the throttle channel. Make sure this channel on the indicator works in the range **0-100% (1-2ms)**. **i)**



13. If you have selected **"Use gimbal"** in the previous steps, assign the individual channels to control it **j)**. You can skip this point and configure the camera gimbal later in the menu ***Configuration -> Channel Assignment –> Assign*** gimbal channels. **j)**



14. Finish the wizard and application settings **k)**. After executing the ***"Apply wizard and finish"*** command, the parameters in the receiver are stored and the stabilization is reset to the mode according to the data you've entered. **k)**

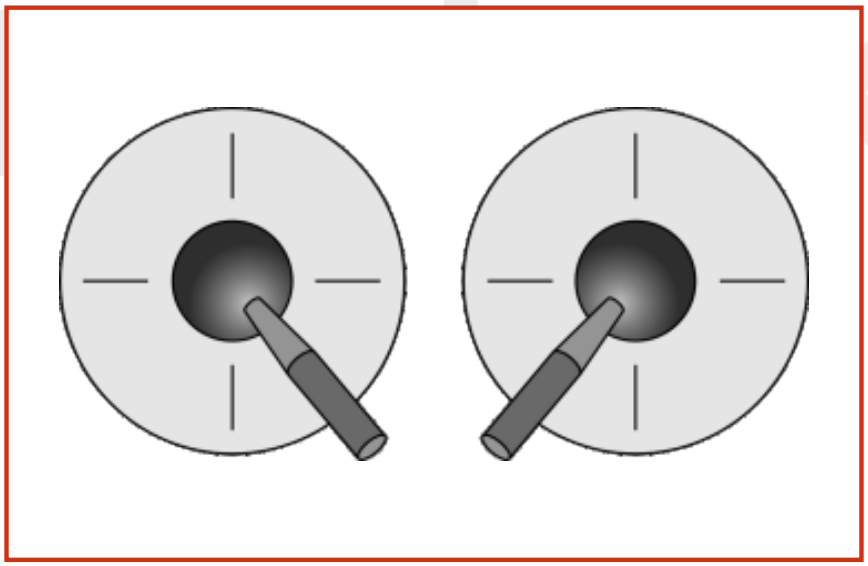


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Attention:
At this point, the settings for individual motors/servo outputs, flight mode configurations and PID control gains will be reset.

15. In the ***Configuration -> Multicopter Settings menu***, test the correct rotation direction of the motors according to the diagram displayed on the top of the screen.

16. Now lay the model on a flat surface - once the stabilization is initialized, the speed controllers usually respond by beeping. Try arming the motors (still without the propellers attached): With the throttle at idle position, move the two sticks to the extreme positions (the elevator fully up and the ailerons with the rudder towards each another):



Motors should start spinning and after 3 seconds without applying throttle they should stop. If the motors are not spinning, check the **"Minimum running throttle"** parameter in the ***Configuration -> Multicopter Settings menu***.

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17. Before your first flight, it is necessary to test the stabilization reaction with the propellers, ideally when the model is mounted on a test bench which allows rotation in only one axis. It is necessary to ensure that the model in the Aerobatic or Sport mode is able to maintain a constant direction at zero stick movement and also to avoid undesirable oscillations.

18. Make your first flight in calm air on a grassy or other soft surface with plenty of space. Start by arming the motors and lightly adding throttle. Use small stick movements to make sure that the receiver responds in correct direction of each axis and tries to stabilize the model. If you experience any unexpected behavior, be prepared to immediately lower the throttle and land. Continue flying in one place and at low altitude - if the flight is unstable or oscillation occurs in any axis, land and adjust the gain of the PID control loop ***(see the next chapter)***. Retest the new setting again in flight.

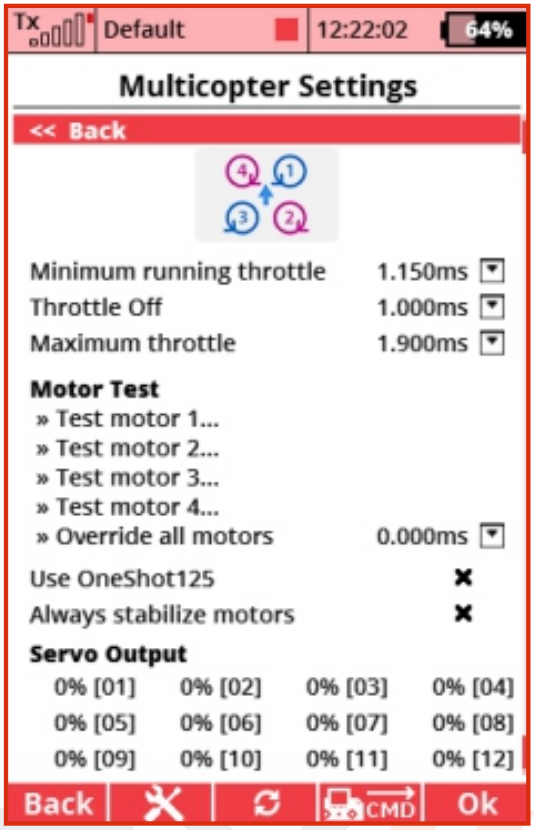
4.2.1 Optimize multicopter settings

Before your first flight with a multicopter model, always test the rotation direction of the individual motors. In the receiver configuration, go to the Multicopter Settings menu. Here, choose a minimum value for running throttle to make the motors slowly spin when the multicpoter is armed.
Set parameters **Throttle Off** and **Maximum throttle** according to the recommended setting from the manufacturer of your ESC.

Test the rotation direction of each motor by activating the command **“Test motor N”**. The corresponding speed controller

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receives a command to run at minimum revolutions for approximately 1s. The rotation direction must correspond to the diagram in the menu on the transmitter display. If the motor rotates in the opposite direction, swap any two motor leads between each other.



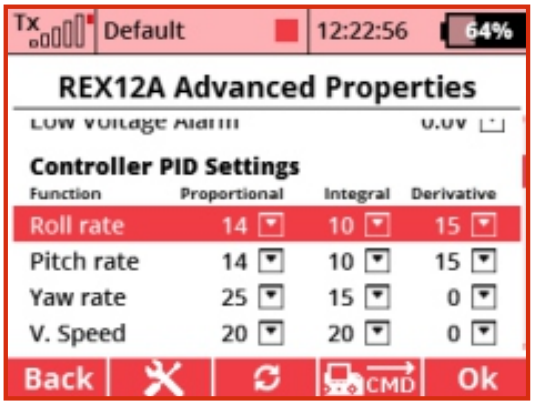
Overwrite all motors - you can enter any value from 0.8 to 2.2ms, which is sent to all motors at the same time after the F4 **"Apply"** button on the transmitter is pressed.

Use OneShot125 - Check this option to enable OneShot125 mode for controlling the multicopter speed controllers. This is a special mode where the pulses from the receiver are 8 times shorter than standard servo pulses. OneShot125 must also be supported by the speed controllers in your model.

Always stabilize motors - after activating this option, the multicopter will be stabilized from the moment of arming and applying the throttle for the first time until the model is disarmed, which means the motors are switched off. Stabilization will always work even with the throttle at idle position. This option is not recommended for first flights with your multicopter.

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If the multicopter is capable of flying, but its behavior is not entirely ideal, it will be necessary to fine-tune the PID gains of the stabilization loop - see the ***Configuration -> Advanced Properties*** menu. Here you can edit individual coefficients for each axis separately.



Proportional coefficient – this is a basic parameter of stabilization. The response of the control unit is directly proportional to the desired rotation speed. If the multicopter is not sufficiently stabilized in some axis, e.g. the pilot must always interfere with the steering to keep the model in the air, increase this factor (at each step, for example, by 20%). Once the oscillation starts, reduce the proportional factor by 20%.

Integral coefficient - determines the weight of stabilization error accumulated from the past. Thanks to integrating, the receiver is able to return the model to its original orientation, even if it has been previously displaced. Set this factor so that the model does not tilt in the air in any axis and keeps a steady attitude in the Sport or Acrobatic mode. If the coefficient is too high, slow but strong oscillations might appear.

Derivative coefficient - The derivative component of the stabilization loop responds to rapid changes in model orientation and is able to suppress, for example, the effects of wind gusts. Edit the value of the derivative component very carefully with small steps, as the model might begin to oscillate very quickly.

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When testing the modified coefficients, take off and apply small but fast movements on the inputs and check if the multicopter reacts quickly, but without overshots. The rudder axis (Yaw) is not so critical for fine tuning the gain - after moving a stick in yaw direction, the multicopter should not become unstable and should not experience significant changes in altitude. Leave the derivative coefficient at zero.

For multicopter models, the altitude and climb/descent stabilization can also be tuned. If the model responds more violently than expected to the climb command, lower the proportional coefficient in the appropriate row (Vertical Speed). Conversely, if it does not respond to the altitude change at all, increase the coefficient value.

4.2.2 Choice of flight modes

Depending on your preferences, choose which flight modes to use during flight - a total of 5 are available, switching between three is available ***(see the Description of flight modes section)***.



For each flight mode, you can set the default gain (this multiplies the proportional, integral and derivative coefficients in all axes), and you can specify whether you want to use gain tuning via special channels (see ***Configuration ->***

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Channel Assignment -> Additional Channels Assignment).

Determine the fail-safe mode:
In intelligent mode, the receiver will stabilize the model horizon (at the last known throttle level). On the other hand, when selecting **"Assist Off"**, all engines will be stopped.

4.3 Description of flight modes

In the REX Assist receiver, you can switch between several flight modes, with the 3 default ones being preset. The default flight modes can be replaced by any combination of the following modes:

4.3.1 Manual (Assist Off): Airplanes
The basic airplane mode where the stabilization function is completely deactivated and the pilot takes over the manual control.

4.3.2 Training: Airplanes
This mode is used by the pilot to get accustomed to the model's behavior, and is also useful for beginners. Basically the stabilization does not interfere with the steering when the model flies horizontally. However, as soon as you want to make a maneuver, the stabilization will not allow you to exceed the maximum safe angles for tilting the aileron axis or the elevator. Aerobatics in this mode is not possible.

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4.3.3 Normal (Damping): Airplanes

This is a basic mode for flying in the wind, suitable for takeoffs and landings. Stabilization works in 3 axes and suppresses the effects of external forces like wind turbulences or gusts. Aerobatics may be unlimited. In this mode, you can use trims even for stabilized axes.

4.3.4 Heading Hold: Airplanes

A mode designed for those aerobatic figures where it is necessary to maintain the constant flight direction. These include, for example, hovering or knife edge flight. Do not use the Heading Hold mode at takeoffs or landings, as there may be a risk of stalling at low speeds and the stabilization would increase the effect even more, which could lead to a crash. Do not use trims in this mode, because any shift of the center position will be perceived as an instruction to start rotation.

For gliders, do not use Heading Hold mode if the model is moving at or near stall speeds (typically when sailing in thermals). The model stops being sensitive to climbing currents, and then dropping and falling may occur because the stabilization correction is not able to fully return the model to its original orientation with the only function of control surfaces.

4.3.5 Stabilization of the horizon: Airplanes and Multicopters

Stabilization of the horizon is also suitable for beginners. In this case, the stabilization algorithm makes it possible to perform basic aerobatics, but if the pilot leaves the controls in the center position, the model is leveled t[illegible] airplane models, keep

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in mind that it is necessary to maintain sufficient speed, as the Heading Hold mode is active at the same time.

4.3.6 Stabilize: Multicopters

The basic functions of the REX A receiver to stabilize the multicopter. The model is kept in a horizontal position during the flight, with the position of the controls indicating the pitch and roll angle of the multicopter. Maximum tilt angles can be defined in the Configuration - Advanced Properties menu, by default it is set to ±45°. In this mode, altitude stabilization is not active, and there is no possibility of aerobatics.

4.3.7 Sport: Multicopters

This mode allows basic aerobatics even for multicopters, since the receiver only stabilizes the rotation speeds in individual axes and does not level the model to the horizontal flight. Altitude stabilization is also deactivated. The transmitter sticks control the rotation speed of each axis, the maximum speed can be defined in the Configuration - Advanced Properties menu (Max. roll/pitch/yaw rate).

4.3.8 Acro: Multicopters

This mode is similar to the Sport mode, additionally with direct stick input applied (adjustable in ***Configuration - Advanced Properties - Aerobatics Factor/Stick Priority***). E.g. The 60% aileron stick priority means that at maximum left or right stick position, the aileron stabilization gain will be reduced to 60%, and from 40% the direct stick position will be applied.

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4.3.9 Altitude stabilization: Multicopters

This mode is similar to the Stabilize mode, with the climb and descent rate being stabilized. The throttle position indicates vertical velocity. In the neutral position of the stick (which is around 1.5ms), constant altitude is stabilized. By adding the throttle, the model starts to climb.

Caution:

If you completely pull the throttle to idle position to reach the maximum descent speed, keep in mind that if you do not use Always stabilize motors option, the stabilization will be completely deactivated and the model may crash. We recommend not fully pulling the throttle when descending, or shifting the throttle curve on your transmitter.

Default flight mode configuration for airplanes		
Position 1	**Position 2**	**Position 3**
Manual (stabilization off)	Normal stabilization mode	Heading Hold
Default flight mode configuration for multicopters		
Altitude and horizon stabilization	Horizon stabilization	Sport

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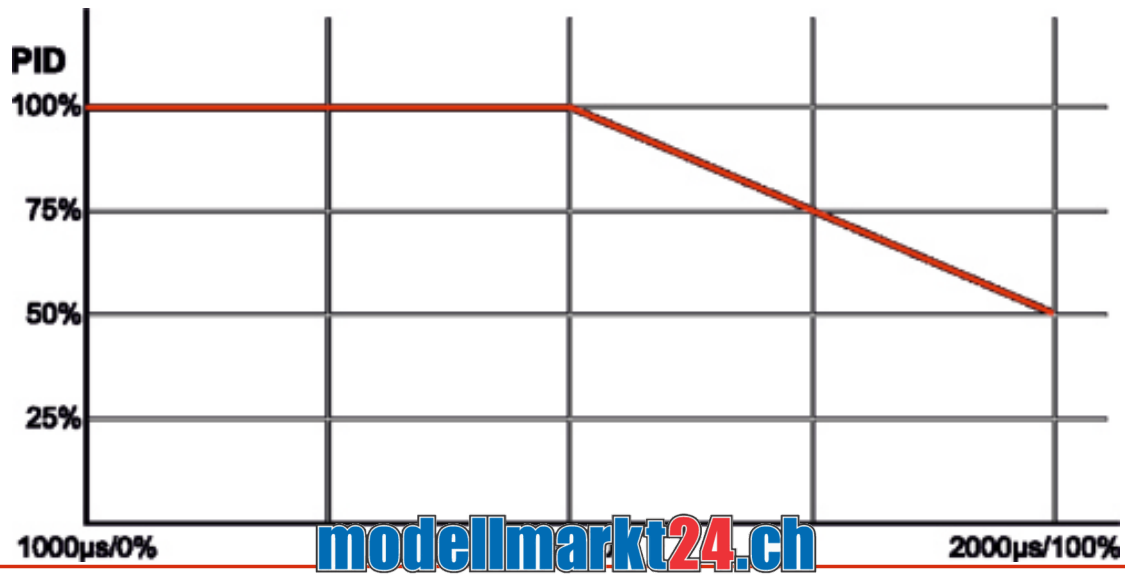
5 Additional stabilization features

Additional functions of the REX A receivers can be used to fine tune or extend the basic stabilization functionality.

5.1 Throttle to PID attenuation (TPA)

This feature is available for multicopter models to help suppress oscillations when throttle is pushed rapidly. If the model flies well with low throttle, but begins fast oscillations when adding throttle, set **"TPA breakpoint"** and **"TPA value"** in the menu ***Configuration -> Advanced Properties***. Set the breakpoint below the level at which the oscillations begin and gradually increase the TPA value in increments of 10%, until the flight is comfortable even with full throttle.

Example of TPA setting in a graph: "TPA breakpoint" = 50%, **"TPA value (PID reduction)"** = 50%. If you set more than 50% throttle, the stabilization gain will begin to decrease to a final 50% at full throttle.



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5.2 Airspeed compensation

This feature is available for airplane models and helps to suppress oscillations in stabilized flight at high speeds. As the control surfaces efficiency increases at the same time as the speed increases, the stabilization gain in the individual axes should be adjusted accordingly with respect to the actual speed so that the resulting stabilization effect is constant throughout the flight and there are no inappropriate reactions.

The airspeed compensation function can be comfortably used in turbine models that are able to move at a high range of speeds. To determine the speed compensation correctly, the model must be equipped with the MSpeed EX sensor (measuring airspeed) or MGPS EX (measuring absolute speed with respect to the Earth's surface). We recommend using an airspeed sensor, which is important for the model's behavior and flight characteristics, for example at stall speeds. The MGPS sensor is simpler to install, but this sensor does not take into account the wind speed, so that the function of compensation won't be accurate in strong wind and at low speeds.

Airspeed compensation setting: In the Receiver Configuration, you will see the **"Advanced Properties"** menu and the **"Speed-PID Attenuation"** section. Set the **"Optimize for speed"** parameter to a usual flight speed, where no oscillations occur. From this speed, the stabilization gain will be gradually reduced.

5.3 Additional channels

To assign additional channels, locate ***Configuration -> Channel Assignment -> Assig***[illegible] For proper operation,

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each channel must first be created on the transmitter – when using DC/DS transmitter via the ***Model menu -> Function Assignment*** and Servo Assignment.

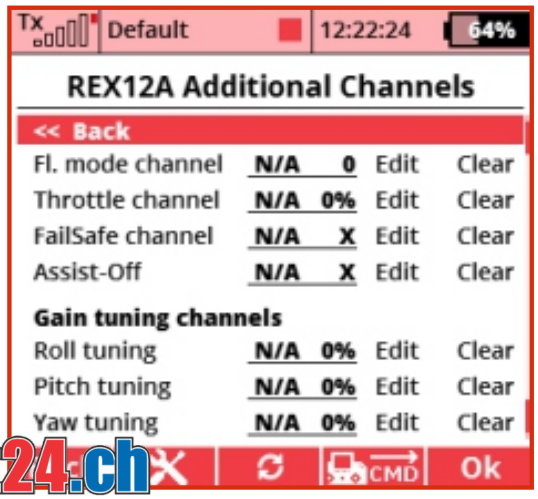
Flight mode switching channel - here you can assign a dedicated channel to switch flight modes. This channel should ideally be operated by a three-way switch on the transmitter.

Throttle channel - is important for multicopter models. A proportional throttle control channel will be shown here.

Fail-Safe channel - Here you can assign a dedicated channel operated by a two-position switch that, after switching to the active position, will simulate the signal loss event. The servos will move to their predefined positions afterwards.

Assist-Off channel - Here you can assign a dedicated channel operated by a two-position switch, which, when switched to the active position, forces the stabilization to switch off (i.e. the airplane model will enter the manual control mode while the multicopter stops the motors immediately).

Gain tuning channels: Ailerons/Roll, Elevator/Pitch and Rudder/Yaw - assign proportional channels controlling stabilization gains in each axis if needed. Positive value increase up to double the default gain, while

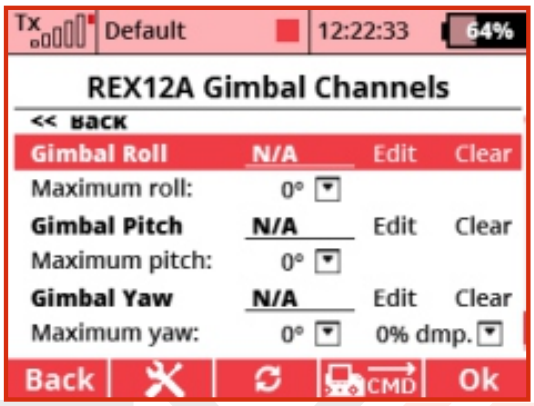


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negative percent values decrease to a minimum of 10%. The value of 0% corresponds to the unchanged default gain value.

5.4 Camera gimbal

REX A receivers support the connection of up to three-axis camera gimbal, whose individual axis (roll, tilt and pan) are controlled by servos connected to individual channels. If you plan to use this feature, activate it in the Assist Setup Wizard, click **"Use gimbal"**. You can configure the individual outputs for the gimbal servos either by going through the wizard (step 7) or in the ***Configuration -> Channel assignment menu - >Gimbal channels***:



Gimbal Roll - Shows the channel assigned in the transmitter to tilt the camera to the left and right. The same channel will be used on the receiver side for the output of the given camera gimbal axis.

Maximum roll - Specifies the angle at which the tilt servo is at its maximum displacement. Set this value so that the image stays stable when moving the model and does not tilt left or right.

Gimbal Pitch - Shows the channel assigned in the transmitter to tilt the camera up and down. The same channel will be used on the receiver side to output the given camera gimbal axis.

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Maximum pitch - Specifies the angle at which the servo is tilted to its maximum deflection. Set this value so that the image is stable when moving the model and does not tilt up or down.

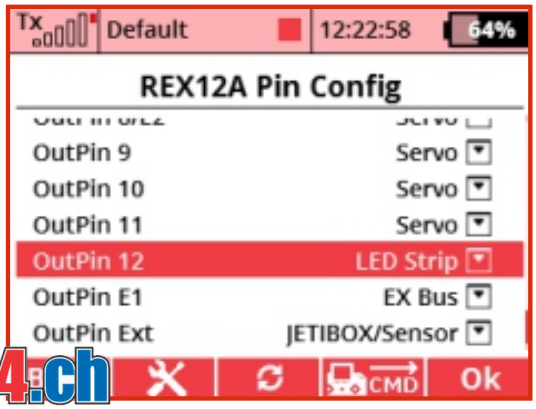
Camera Yaw (pan) - Shows the assigned channel on the transmitter to rotate the camera. The same channel will be used on the receiver side to output the given camera gimbal axis.

Maximum yaw - Specifies the angle at which the servo is rotated to its maximum deflection at maximum damping. Set this value so that the image is stable when the model moves and does not rotate.

Damping (dmp.) - Damping factor in the rotation axis. The higher the value, the longer the camera will stay in the original direction, and it will take longer time for it to turn to the new direction. At 100% the gimbal will always try to keep the original orientation.

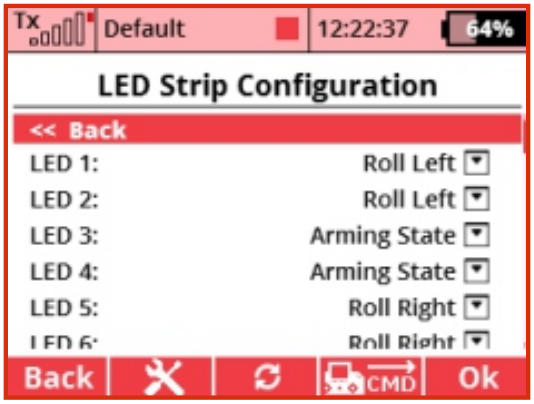
5.5 Connecting an external LED strip

The REX A receivers support the connection of an external LED strip consisting of up to 32 programmable RGB LEDs of the WS2812 type. A single receiver port is dedicated to the strip, which must first be configured to enable the strip. In the ***Configuration –> Alternative Pin Configuration*** menu, select the dedicated output pin



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and switch it to **"LED Strip"** configuration. The **"LED Strip Settings"** link then appears in the receiver configuration, allowing you to change the colors and functions of the individual LED chips.



Off	The LED is off
Arming State	The color indicates the "Armed" and "Disarmed" states.
Flight Mode	The color indicates the active mode from three possible.
Roll Left	Blinking in orange indicates the tilt in the aileron axis to the left.
Roll Right	Blinking in orange indicates the tilt in the aileron axis to the right.
Color	The following are available: white, red, orange, yellow, lime green, green, mint green, cyan, light blue, blue, dark violet, magenta, deep pink.

The connection of LED strip itself is simple, you can connect the three-core cable terminated with the JR connector on the input side of the strip (with the pad marked Din). This connector is then plugged into a dedicated port in the receiver.



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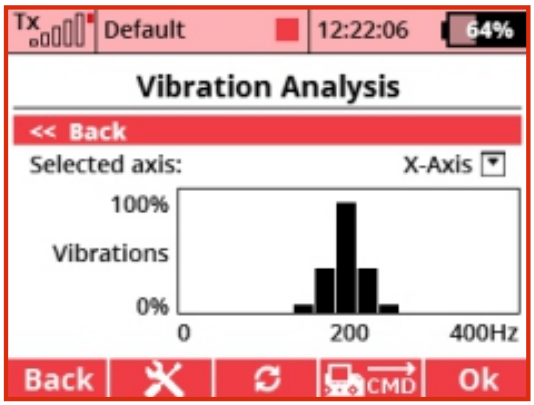
5.6 Sensor data filtering

REX A receivers embed advanced digital algorithms for filtering sensor data. The algorithms are designed to suppress undesirable effects caused by vibrations in the model. Two types of filters are used:

Low Pass Filter - This type of filter transfers frequencies below the set limit and all higher frequencies are suppressed. Its basic task is to separate the desired data containing changes in model attitude (low frequency) from unwanted vibrations (high frequencies).

Band Filter (Notch Filter) – It's used to filter out specific frequencies caused by engine vibrations. You can additionally activate this filter if the vibrations caused by the engine are relatively high. Check the vibration level regularly via **"Vibration Analysis"** receiver menu with the engine running. The engine should run at such revolutions as are most common in flight.

Example of band filter adjustment:
The illustration shows vibrations of a motor that rotates at 200Hz, 12000 rpm. We will choose the average filter frequency of 200Hz, as there is a peak in this area. We set the filter bandwidth somewhere between 50-150Hz. The narrower the filter bandwidth, the more precisely the fi[illegible] the signals with the



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specified frequency. However, as the motor speed and thus the vibration frequency changes during flight, it is preferable to choose wider bandwidth, approx about 100Hz.

Set both types of filters in the ***Configuration -> Advanced Properties*** and the Filtering section.

5.7 Sensor calibration



Sensor calibration is important for the correct and accurate function of stabilization. The receiver calibrates the offsets of an internal gyroscope automatically, always after the receiver is switched on. Approximately for 2 seconds after turning on, keep the model at stationary position. It's not required to keep the model horizontally, but the tilt angle should not exceed 30°. Once the gyroscope is calibrated, the stabilization is armed and ready for flight.

The internal barometer is being calibrated at the same time as the gyroscope to create a reference zero level for calculating the relative altitude.

Calibration of the accelerometer is a more complex process. The receiver is already calibrated from the factory, but due to the Earth's gravitational field, which is not constant all over the planet, the accelerometer can show inaccurate measurements. We recommend you to calibrate the accelerometer also when you configure

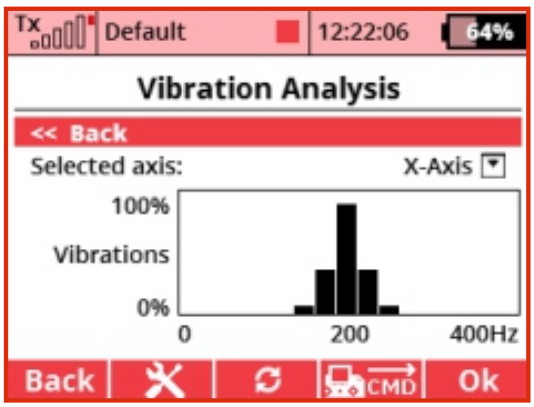
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the receiver in a new model for the first time:
In the receiver menu, view ***Telemetry -> Sensor Calibration*** screen. Activate the ***"Start calibration"*** command and follow the instructions. The receiver must be placed on a horizontal board with one of its six sides and kept still for about 2 seconds. Once the position is correctly recorded, the ***"Remaining positions"*** line is decremented - at this time rotate the receiver and place it on the board by another side. Repeat until the number of remaining positions is greater than zero.

After completing the calibration, please make sure that the total G-Force displayed on the Telemetry screen lies in the range of 0.99 - 1.01G (measured at rest).

5.8 Vibration analysis

Vibrations are an undesirable phenomenon for any stabilization system, as it adds unwanted noise into measurement. In the receiver menu, you can display a graph showing the actual vibration level. It's measured using frequency analysis in the selected accelerometer axis.



The receiver itself contains effective algorithms to suppress the vibrations (see ***Configuration -> Advanced Properties***), but the cost is a relative reduction of the model's preciseness and

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maneuverability.

If the vibrations are too high (in the graph approximately over the half of Y axis), we recommend taking some of the following precautions to reduce them:

- Fix the receiver in the model with a soft double-sided adhesive tape.

- Secure the cables leading to the receiver so they cannot move arbitrarily in the model which could amplify the vibrations.

- Use a balanced propeller.

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6 Advanced properties

Output period - setting the output signal period (Auto setting can be used to synchronize outputs with the transmitter). This parameter fundamentally affects the behavior of the servos. Setting lower output period leads the analogue servos to achieve faster response and increases current consumption. Some types of analogue servos may behave erratically if the value is set too low.

Number of PPM channels - Set the number of channels encapsulated in the PPM serial stream. If the receiver gets fewer channels than this setting, the remaining channels (in the Computed mode) will be replaced by a default value specified in the Fail-Safe position for each channel. Otherwise, the number of output channels will be reduced to the set value.

PPM/UDI Mode - Defines how the transmitter data is processed. You can choose from the following modes:

- ***Direct*** - The PPM and UDI output signal contains data directly from the transmitter without any recalculation.
  - Conversions and eventual channel mapping are only applied to servo outputs.
  - Various settings for servo outputs and for PPM/UDI can be set.
- ***Computed*** - Both servo outputs and PPM or UDI signals are recalculated and mapped.
  - Output pulses for servos and PPM/UDI contain the same information, but neither PPM nor UDI carries flight-stabilized data.

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Note: This option does not apply to EX Bus outputs. These are always direct without receiver recalculation (if the function "Stabilize EX Bus output" is not activated).

Stabilize EX Bus output - Check this option to ensure that flight stabilization is applied to the EX Bus output. In such case, the serial data will correspond directly to servo outputs. This mode is useful if you are planning to use the REX A receiver with stabilization enabled along with a **Central Box 100/200/400**.

Low Voltage Alarm - Used to set the decision level of the low voltage alarm, which is indicated by the receiver itself. You can also set the low voltage alarm directly in the DC/DS transmitter (***Timers / Sensors -> Alarms menu***).

6.1 PID control setting

Aileron/Roll rate, Elevator/Pitch rate, Rudder/Yaw rate - In this section you set the individual PID control coefficients for each axis separately for multicopter models. These coefficients are applied in all flight modes to stabilize the rotational speed around each axis.

Vertical Speed - PID coefficients to stabilize the climb and descent rate.

Aileron/Roll angle, Elevator/Pitch angle, Rudder/Yaw angle - Here you can change the proportional gain of attitude stabilization, e.g. horizon. The higher the coefficients you specify, the faster the model is reoriented to the [illegible] attitude.

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6.2 "Stabilize" mode setting

Maximum roll angle - Defines the maximum possible tilt angle to the left and right in the horizon stabilization mode (controlled by aileron input).

Maximum pitch angle - Definition of the maximum possible tilt angle in horizon stabilization mode (controlled by elevator input).

Minimum pitch angle - Definition of the minimum possible tilt angle in horizon stabilization mode (controlled by elevator input).

PID transition delay - Used to switch between flight modes that use stabilization with different gains of the PID coefficients. This feature guarantees that the change of the coefficients does not cause erratic behavior in flight.

Sensor trim (Roll/Pitch) – Using these parameters you can fine-tune the receiver position in the model if its position is not absolutely parallel to the axis of ailerons and the elevator. Sensor trims are applied in the flight modes where the horizon is stabilized and you can achieve, for example, with airplane models a slightly pulled horizontal flight.

Quick trim setting: Place the model on a flat solid horizontal surface so that its position exactly matches the horizontal flight (a multicopter should be positioned exactly horizontally). Now in the Receiver ***Configuration -> Advanced Settings -> activate*** the ***"Set sensor trims now"*** command. The calculated values will be stored in receiver memory.

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6.3 Acro mode settings

Maximum Aileron/Roll rate, Maximum Elevator/Pitch rate, Maximum Rudder/Yaw rate - Specifies the maximum angular rotation speed in individual axes (in degrees per second) that can be safely reached by the model. For acrobatic models, this value can be up to two revolutions per second (720°/s), but for gliders it will be noticeably smaller (e.g. 90°/s).

Aerobatics Factor (Roll/Pitch/Yaw stick priority) - Determines how the stabilization gain will be decreases depending on how the control stick moves away from the center position. For example, a 60% aileron stick priority means that at maximum left or right stick position, the aileron gain will be reduced to 60% and the direct position of the stick will be applied from 40%.

Throttle-PID Attenuation (TPA) – A function for multicopter models, see Chapter 10, **"Other stabilization features"**.

Speed-PID Attenuation – A function for airplane models, see Chapter 10, **"Other Stabilization Functions"**.

Dead Zone

Dead zone parameters indicate the size of the area around the center position of the controls, where the resulting stick position in the given direction is considered zero.

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6.4 Filtering

Low-Pass filter frequency - Here you enter the frequency of the digital filter (in Herz units) to suppress vibration noise on the gyroscope. Keep in mind that the lower the frequency you enter, the less the model will be prone to vibration, but the accuracy and speed of flight stabilization will be limited. The recommended value is 10-20Hz for airplanes and 20-60Hz for multicopters.

PID Derivative Low-Pass filter - Here you enter the frequency of the digital filter (in Herz units) to suppress noise of the derivative component of the stabilization control loop. Recommended value of 20Hz should be modified with caution.

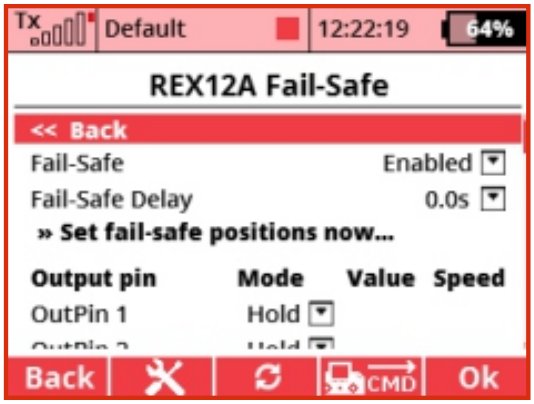
Filter specific frequency - By enabling this option, you enable advanced filtering to remove specific vibrations caused by motor running. Adjust the average filter frequency and filter bandwidth according to the vibration analysis graph.

Arming switch

The arming procedure is automatic for airplane models so that the stabilization is enabled automatically after receiver initialization. On the contrary, for multicopters, you must move the controls to the extreme positions when the throttle is pulled low for arming. Alternatively, you can assign a two-position switch on the DC/DS transmitter to arm the stabilization and make the propellers spin. This switch does not need to be assigned to any channel on the transmitter - the arming command is sent separately as soon as you confirm the dialog box that appears after activating the switch.

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6.5 Fail-Safe



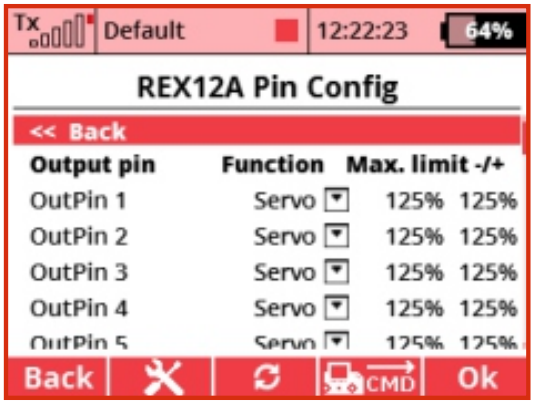
Fail-Safe – Turns the Fail Safe function on or off. If the function is disabled, no pulses on the receiver outputs are generated in case of signal loss. If this function is enabled, the receiver outputs can be configured individually with the following options:

- **Hold** - The receiver repeats the last known values on its output.
- **Out OFF** - the output pin is deactivated.
- **Fail-Safe** - the output is moved to a position given by the parameter **"Value"** at a speed given by **"Speed"** parameter. You can set the Fail-Safe positions either by editing each output value separately or by simply moving the transmitter controls to the required position and activating the **"Set fail-safe position now"** command.

Fail-Safe Delay – Indicates the time interval from a moment the receiver detects signal loss to when the fail-safe control throws are initiated. After the expiration of this time, the receiver outputs will transfer to preset defaults or will be turned off (according to individual pin settings).

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7 Alternative pins configuration



Here you can change the modes of the receiver pins. Servo outputs can be configured, for example, in digital input or digital output mode.

Servo - standard impulse output for servo control (-100% ~ 1ms, 0% ~ 1.5ms, + 100% ~ 2ms).
If the output pin is set to "Servo" mode, you can specify maximum possible throws that will never be exceeded. These limits should be adjusted to protect individual servos against overshots and model damage.

Digital input - the logic value of a given signal pin (0 or 1) is transferred to the transmitter in the form of EX telemetry (so it can be further displayed and stored). Receiver pins are equipped with internal pull-up resistors, so you can easily connect the signal wire to the ground for logic level detection. It is not allowed to connect external voltage to this pin.

Digital output - the receiver will discretize the channel value of the given pin. If this value is greater than 1.5ms (>0%), the output pin value will be logic **"1"**. Otherwise, the output value will be logic **"0"**. Using this approach, you can control e.g. simple model lighting made up of LEDs. In this mode, the Fail-Safe settings for the pin are also applied.

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Motor 1-8 - for a multicopter model, this parameter is used to identify individual motors (assignment is made automatically via the Quick Wizard). Refresh rate of the motor outputs is 400Hz by default, and conventional servo pulses or OneShot125 protocol can be used for control.

Camera control (roll, tilting/pitch, and pan/yaw) - output pins assignment for a stabilized camera gimbal controlled by servos.

PPM Positive Output - standard PPM signal with positive logic of the PPM data stream. The idle state of the line is logic 0.

PPM Negative Output - standard PPM signal with inverse logic of the PPM data stream. The idle state of the line is logic 1.

PPM Input - For a given receiver port, the PPM input signal from another receiver is expected. This option is suitable if you want to use a backup receiver with a PPM output stream.

JETIBOX/Sensor EX - connection of telemetry sensor or JETIBOX.

EX Bus - digital bidirectional communication for channels transmission, telemetry and communication data. This setting is suitable for example in connection with a Central Box or other EX Bus-capable device.

Serial UDI12/16 - serial output suitable for connection of devices with UDI support (Universal Data Interface, e.g. Vbar).

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LED Strip - A LED strip composed of programmable LED chips can be connected to the dedicated pin of the receiver.

Table of possible functions on the individual receiver pins

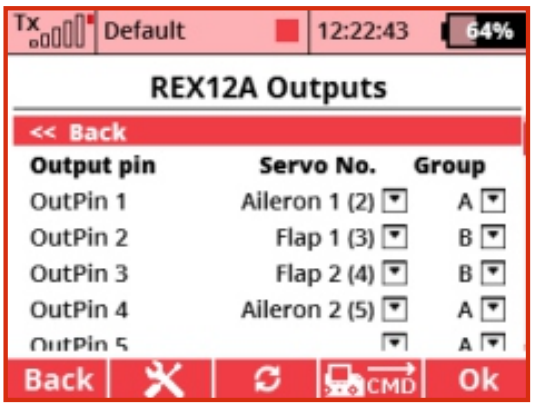
	REX 6A	REX 7A	REX 10A	REX 12A
Pin1	Y1	Y1	Y1	Y1
Pin2	Y2	Y2	Y2	Y2
Pin3	Y3	Y3	Y3	Y3
Pin4	Y4	Y4	Y4	Y4
Pin5	Y5/E1	Y5, LED Strip	Y5, LED Strip	Y5
Pin6	Y6/E2	Y6/E1	Y6	Y6
Pin7	Ext.	Y7/E2	Y7	Y7
Pin8		Ext.	Y8/E2	Y8/E2
Pin9			Y9	Y9
Pin10			Y10	Y10
Pin11			Bat.	Y11
Pin12			Bat.	Y12, LED Strip
Pin13			E1	E1
Pin14			Ext.	Ext.

Output types:
Y - servo output, digital output, digital input, motor 1-8 (multicopters), camera roll, pitch, and yaw.
E1,2 - JETIBOX/EX sensor, PPM output, PPM input, EX Bus output, UDI output
Ext. - JETIBOX/EX sensor

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7.1 Receiver Outputs

The receiver output settings screen allows you to redirect the transmitter channels to any receiver output. For clarity, the transmitter channels are described by their numerical value and their meaning.



As the last parameter, you can set the output group (A-H) for each servo separately. Assigning servo outputs to the same group means that their control pulses will be generated at the same time. For the 100Hz mode, we recommend using only A-C groups. In addition, please note that the servos belonging to the same function should be ideally in the same group.

Note:

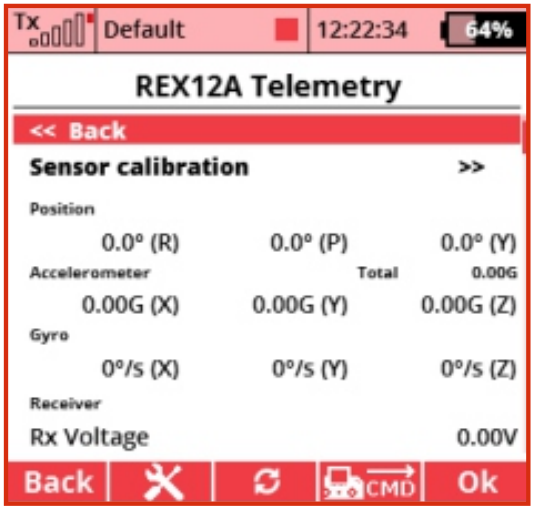
Channel redirection is applied to the received data before stabilization processing, so after any change in the output pins assignment, we recommend you to re-calibrate the "Assist channels in the Configuration -> Channels Assignment" menu.

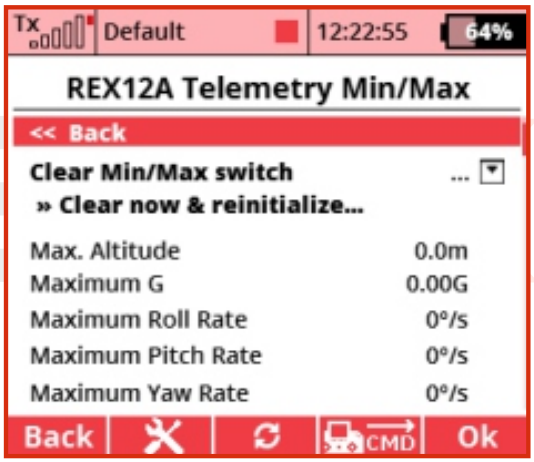
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8 Real time telemetry

By default, the receiver provides operational telemetry data such as battery voltage and signal strength on a scale from 0 to 9. With integrated inertial sensors, it can also provide its orientation in individual axes (roll, pitch and yaw) or total G-force.

Up to 3 additional Duplex sensors can be connected to the receiver. For this purpose you can use the ports marked Ext, E1 and E2 (the latter two must first be switched to the role of telemetry inputs).





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9 Solving the most common problems

9.1 General

1. After pairing the receiver, it is not possible to configure it using the DC/DS transmitter. But the Device Explorer screen displays the correct name (e.g. REX12A).
Check the transmitter version (minimum version supporting the ***REX A receiver is 4.24)***. Also, make sure that in the Devices folder at your transmitter contains files which match the receiver name and its language version: **"REX12A.BIN"**, **"RX12AEN.BIN"**, **"RX12ACZ.BIN"** etc. If these files are not located in the folder, please download the latest configuration files for the receivers from ***www.jetimodel.com***. These files are also a standard part of the transmitter update.

9.2 Airplane models

1. At high speed and straight flight, the model oscillates in one of the axes (e.g. ailerons). Reduce the Gain value for that axis in the receiver settings (***Configuration - >Airplane Settings*** menu).

2. In Heading Hold mode, the model does not hold its direction.
Increase the Hold value for the elevator or rudder axis in the receiver settings (***Configuration -> Airplane Settings*** menu).

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3. In Heading Hold mode, the model does not hold a straight flight and constantly turns to one side.

In this mode, it is not possible to use trims as they distort the input information for stabilization. Switch to Normal mode (or deactivate stabilization if necessary), trim the model in straight flight and land. Now reassign the primary channels (***Configuration -> Channel Assignment*** menu).

4. When the stabilization is enabled, the surfaces do not return to the center position even when the model is at rest for a longer time.

In Heading Hold mode, the model remembers its original direction before displacement and tries to return to that position. Therefore, control surfaces may be out of neutral even when the model is at rest. Switch stabilization to another mode (e.g. Normal or Manual).

5. Stabilization gain tuning channel for ailerons, or other axis, cannot be assigned.

Please make sure that the stabilization gain tuning function has been created on the transmitter and has been assigned to a free channel (1-16). Stabilization gain control knob, or a three-way stabilization flight mode switch (Off/Normal/Heading Hold) should be added in the ***Model -> Functions Assignment*** menu in your DC/DS transmitter. Subsequently select this function for a free channel in the ***Model –> Servo Assignment*** menu. Now it is possible to start the Quick Wizard in the receiver menu, where in step 6 this three-position switch can be used.

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9.3 Multicopter models

1. The transmitter announces "Armed", but the motors are not spinning.

In the ***Configuration -> Multicopter Settings*** menu, be sure to pay attention to the Minimum running throttle parameter. Increase the value in small steps to make the motors spin after arming.

2. When at full throttle, the multicopter oscillates quickly, but when the throttle is in the middle, the flight is calm.

We recommend enabling the ***"Throttle-PID Attenuation (TPA)"*** function in the ***Configuration -> Advanced Properties*** menu. Set the ***"TPA breakpoint"*** to a value before the oscillations start to appear (e.g. 50%) and increase the ***"TPA value"*** by 10% increments.

3. Stabilization gain tuning channels for individual axes cannot be assigned.

Please make sure that the stabilization gain tuning function has been created on the transmitter and has been assigned to a free channel (1-16). Stabilization gain control knob or a three-way stabilization flight mode switch should be added in the ***Model -> Functions Assignment*** menu in your DC/DS transmitter. Subsequently select this function for a free channel in the ***Model –> Servo Assignment*** menu. Now it is possible to start the Quick Wizard in the receiver menu, where in step 6 this three-position switch can be used.

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10 Receiver update and configuring

Duplex REX receivers can be updated via PC with the aid of the JETI USB adapter. You may find a detailed description of the receiver update process in the USB adapter instruction manual.



USB adapter

10.1 Update the receiver

REX A receivers can be updated and configured by PC via JETI USB Adapter. The JETI Studio software can be used for updates – you can download it from the manufacturer's website:

www.jetimodel.com

1. Unplug all devices (servos and sensors) from the receiver before you begin the update.
2. Connect the USB Adapter to your computer.
3. Start JETI Studio and select the correct serial port for communication.
4. Open the Device Updater dialog.



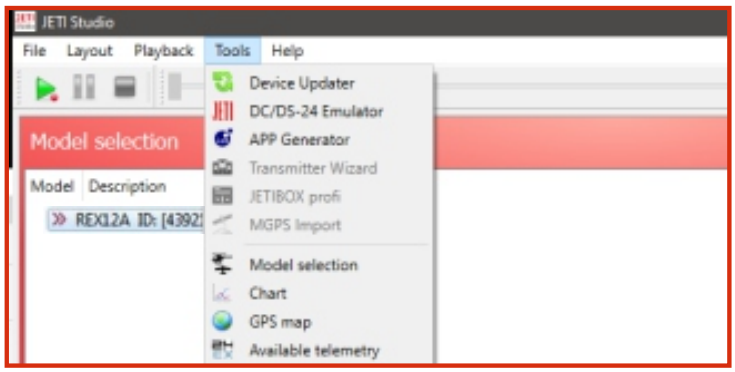
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5. Connect the receiver via its Ext. port to the USB Adapter.
6. The program identifies the connected device and offers an appropriate update. Choose the firmware version and variant and then click the Update button.
7. Once the update is completed, disconnect the receiver.

10.2 Configuring the receiver with a PC

Using the JETI Studio software, REX A receivers can also be configured by the owners of Duplex Tx modules.

1. Connect the receiver via its Ext. port to the **USB Adapter** and then to the computer. If the receiver is powered through a USB Adapter, make sure that all servos are disconnected.
2. In **JETI Studio**, choose the Device Explorer tool. The receiver should be detected and displayed after a moment. By double-clicking you can now enter its configuration.



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ELECTROSTATIC SENSITIVE DEVICE OBSERVE HANDLING PRECAUTIONS

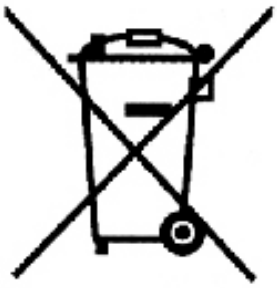
For receivers we grant a warranty of 24 months from the day of purchase under the assumption that they have been operated in conformity with these instructions at recommended voltages and that they were not damaged mechanically. Warranty and post warranty service is provided by the manufacturer.

We wish you sucessful flying with the products of:
JETI model s.r.o. Příbor, www.jetimodel.com

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ENGLISH

Information on Disposal for Users of Waste Electrical & Electronic Equipment (private households)



This symbol on the products and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.
For proper treatment, recovery and recycling, please take these products to designated collection points, where they will be accepted on a free of charge basis. Alternatively, in some countries you may be able to return your products to your local retailer upon the purchase of an equivalent new product.
Disposing of this product correctly will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point.
Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

Information on Disposal in other Countries outside the European Union

This symbol is only valid in the European Union.
If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

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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.

Warning: *Changes or modifications to this device not expressly approved by Esprit Model/JETI USA could void the user's authority to operate the equipment. "This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment is in direct contact with the body of the user under normal operating conditions. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter." Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.*

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. This device complies with the Industry Canada license-exempt RSS standard(s).

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Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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- Receivers
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- Display units



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