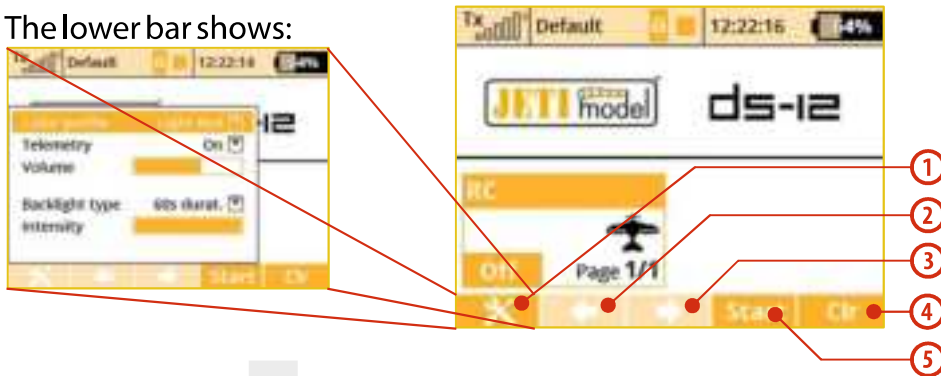The lower bar is found at the bottom of the main display.

The lower bar shows:

1. **Tools -** fast transmitter setup: **Color profile, Telemetry, Volume, Backlight duration, brightness**

2. **Left Arrow**-move left within the desktop pages.

3. **Right Arrow**-move right within the desktop pages.

4. **Clr**-resets the timers or opens the Data Analyzer application in the main desktop window.

5. **Stop/Start**-begin and end flight timer, triggering timers or telemetry recording.

Use the corresponding **F1-F5** buttons to select these options

From the main display you may access the main menu by pressing the **"menu"** button. To return from the main menu press either the **"menu"** or **"esc"** button.

From the main display, when you push any of the trim buttons or the **3D button** the *"Trim menu"* will be displayed.

7.2   Navigation in the Menu

7.2.1 Navigation

1.   The **„menu"** button allows you to switch between the main display and the transmitter's main menu.

> *Advice: Also, If you push this button while turning the 3D Control Selector to edit values, the values can be changed faster. With the menu button pressed, 10 more values are changed per turn.*

2.   The **"esc"** button allows you to move one level back within the menu. If you push this button while you are editing a value you will return one menu level and the edited value will NOT be stored.

3.   **3D Control Selector**

   3a - by turning the selector **counter-clockwise you will move up in the menu.** Turning the selector this direction will also **decrease** any value you are editing.

   3b - by turning the selector **clockwise you will move down in the menu.** Turning the selector this direction will also **increase** any value you are editing.

   3c - by **pressing** the selector you will confirm your choice/enter the selected menu.

4.   The **„F1 - F5"** functions buttons located below the display are used to select various options based upon the current display.
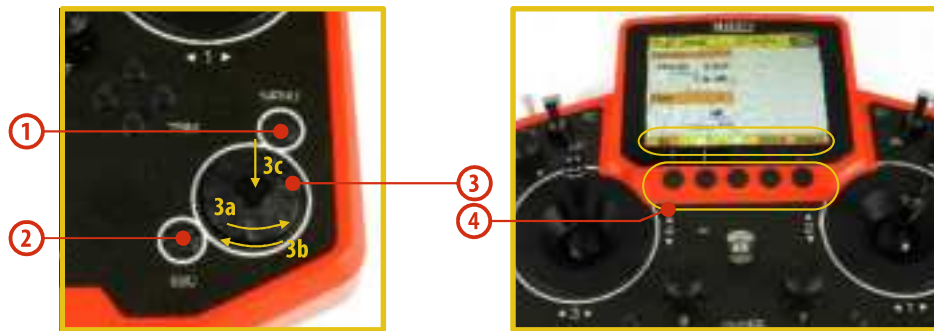
7.2.2 Browsing through the Menu

The current selection within the menu (cursor) is designated by reversed text/shaded graphics. By turning the 3D control selector left/right you will move through the lines of a menu.

To select an item, first highlight the line and then press the **"3D button"**, to select the line. Rotate the 3D control selector to highlight your selected item within the line, then press the **"3D button"** to select the item. Rotate the 3D control selector either left or right to change the value of your chosen item. By pressing the **"3D button"** again you will confirm the storage of your selected value and go back to your previously selected menu item. If you want to go back to select another line within the previous menu press the **"esc"** button.

Note: For each press of the "esc" button, you are taken back one menu level.

7.2.3 Basic Menu Structure

* Model
- Select Model
- New Model
- Basic Properties
- Model Image & Colors
- Functions Assignment
- Servo Assignment
- Servo Setup
- Device Explorer

* Fine Tuning
- Flight Modes
- Digital Trim
- Flight Mode Trim
- Dual Rate/Expo
- Function Curves
- Aileron Differential
- Gyro Settings (Heli)
- Throttle Limiter (Heli)
- V-Tail, Delta Mix, Ailevator Mix (Aero)
- Butterfly (Aero)
- Snap Roll
- Free Mixes

* Advanced Properties
- Other Model Options
- Sticks/Switches Setup
- Wireless Modes/Trainer
- Logical Switches
- Sound on Event
- Sound of Prop. Controls

- Telemetry Controls
- Voice Commands
- Sequencer
- Accelerometer

* Timers/Sensors
- Timers
- Alarms
- Vario
- Voice Output
- Sensors/Logging Setup
- Displayed Telemetry
- Main Screen

* Applications
- Data Analyzer
- Audio Player
- JETIBOX
- Games (Snake, Tetris, Chess...)
- Image Slideshow
- Microphone
- User Applications

* System
- Configuration
- Servo & Range Test
- View Inputs
- Receiver Output
- System Sound
- Sound Volume
- USB
- Info

7.3 Model Set-up Guide

In this section we will guide you, step by step, through the process of creating a new model airplane and helicopter. Each step of the guide will be complete with associated transmitter menu photos. If you follow the step by step guide you should become familiar with how to create a model profile. You may even use these concepts and the "**General**" model type to create your own, user-defined model profile.

7.3.1 Airplane

Let's create a simple model airplane. Our example will be a motor glider with ailerons controlled by two servos, an elevator and a rudder each controlled by one servo.

Servo assignment:

1. Throttle
2. Aileron 1
3. Aileron 2
4. Elevator
5. Rudder

Before you begin creating a model, make sure that you have set up the correct transmitter mode in "Main menu -> System -> Configuration -> MODE 1-4". The basic, standardized, assignment

of transmitter inputs to flight controls are based upon this selection.

First it is necessary to create a model in the transmitter and then bind the DS-12 transmitter with the receiver which will control the given model. *See chapter 8.3: „Receiver->Binding".*
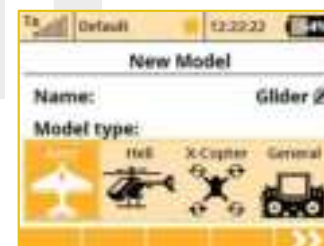
Warning: For safety reasons we recommend first removing the propeller.

1. Switch-on the transmitter. In the main display push the key *„menu"*. Select the item *„Model"* and push the *„3D button"*.
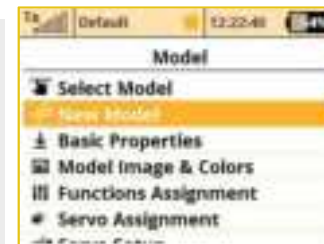
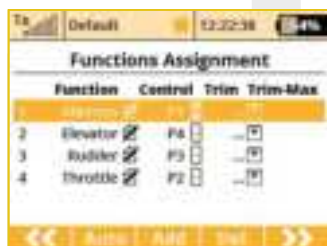**2.** Select the item *„New model"* and push the *„3D button".*

3. Enter the name of your model and press *„F5(OK)"* (Note: you must enter a model name to proceed.) Then select the model type *„AERO".* Confirm by pushing the *„F5(Next)"* button.
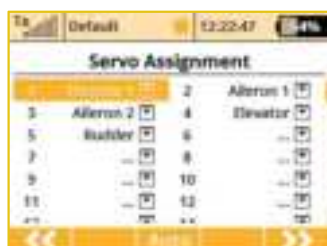

4. Choose an optional model image and color profile according to your personal preferences. The images must be loaded to the internal SD card before you use them. You can skip this step by pressing *"F5 (Next)"* button.

5. Select your wing type. Because this example has 2 aileron servos, select *„Wing type" 0FLP/2WING.* Do not change any other setup items like tail assembly, number of motors, number of spoilers or number of landing gear servos. Continue by pushing the *„F5(Next)"* button.

6. This page displays the flight control functions and their transmitter switch assignments. Here you can verify that your flight control functions are correctly assigned to the transmitter switches/sticks. If they are not, check and make sure that you have selected the proper transmitter mode. Confirm the assignments by pushing the **"F5(Next)" button.**

7. This page displays the assignment of functions to your receiver outputs (servos). You may change the assignments by editing the output assignment for each receiver channel. Otherways confirm with the **"F5(Next)" button.**

8. The screen will now display a request which asks if you really want to create and activate the new model. Confirm with the **"F5(Yes)" button.**

9. The Servo Setup menu is where you set the servo neutral positions, servo output travel limits, servo reversing, delay etc. You will come back to this menu after binding the receiver with your transmitter. Press the **"F5(OK)"** button and you are taken to the main screen where your new model is displayed in a desktop page.

Bind transmitter with the receiver, *see chapter 8.4 Receiver->Binding.*

Once your transmitter has been bound with the receiver and you have re-applied power to the receiver, the last setup phase is the tuning of your servo output functions, *see chapter 7.3.5 Setup of receiver outputs.*

With this type of wing configuration there is usually a mixer used to also raise the ailerons as spoilers (spoilerons). Follow the steps below the set up this mixer. In this example we will use the "**right side control lever(5)**" for the proportional control of the spoilerons.

a. From the main screen, push the *„menu"* button. Select *„Fine tuning"* and push the *„3D button"*.

b. Next, select *„Butterfly"* and push the *„3D button".*
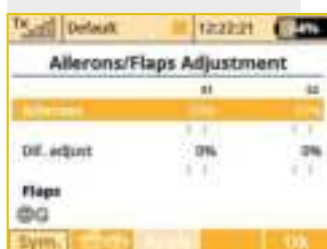
c. In the first menu line push the **"3D button"** ‚select **'Switch"** and push the "**3D button**" again. Next, move the **"right side control lever(5)".** Confirm with the **"F5(OK)"** button. The last step in this menu is to set the amount of travel that your ailerons will move as spoilerons (or flaperons) and to set any desired elevator compensation.

Note: When setting up your spoilerons be sure that the ailerons still have enough travel to control your airplane when the spoilerons are deployed. In this menu the "(Sym) F1" button will link or unlink the spoilerons if you need to set them independently

7.3.2 Helicopter

Let's create a simple model helicopter. In this example, the helicopter is controlled by a swash plate with three servos at 120° orientation and the motor has no governor.

Servo assignment for the receiver channels:
1. Throttle
2. Elevator (Swash 1F)
3. Collective (Swash 2L)
4. Aileron (Swash 3R)
5. Rudder (Yaw)
6. Gyro(Gyro sens.)

Before you begin creating a model, make sure that you have setup the correct transmitter mode in **"Main menu -> System -> Configuration -> MODE 1-4".** The basic, standardized, assignment of transmitter inputs to flight controls are based upon this selection.

First it is necessary to create a model in the transmitter and then bind the DS-12 transmitter with the receiver which will control the given model. *See chapter 8.3: „Receiver->Binding".*

Notice: For safety reasons we strongly recommend removing the main/tail blades or disconnecting the motor when working with an electric helicopter.

1. Switch on the transmitter. In the main display push the key **"menu"**. Select the item **"Model"** and push the **"3D button"**.
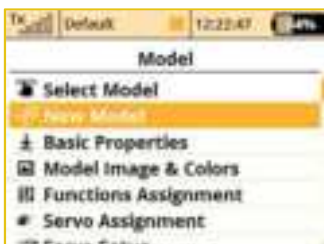
2. Select the item **„New model"** and push the **„3D button".**

3. Enter the name of your model and press **"F5(OK)"** (Note: you must enter a model name to proceed.) Then select the model type **"Heli".** Confirm by pushing the **"F5(Next)"** button.

4. Choose an optional model image and color profile according to your personal preferences. The images must be loaded to the internal SD card before you use them. You can skip this step by pressing **"F5 (Next)"** button.

5. Select the helicopter swash plate type **"3 servos (def 120°)".** Change the second menu item **"Position of front servo"** to **"Rear"** – the swash plate servo orientation will be turned 180°. Confirm the change by pressing the **"F5(Next)"** button.

button. When you create a new helicopter model, you are required to define the swash plate configuration for the model. Please refer to your helicopter's instructions and verify that you have the correct swash plate configuation. If you find that you need to change your swash plate configuration, you can always go to the **"Model -> Basic Properties"** menu to make the change.
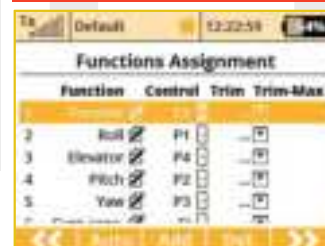
6. The **"Functions Assignment"** menu lists the flight functions and their control switch/stick assignments. If you want to change any of the switch/stick assignments, select the **"Control"** item for your flight function and then select your desired switch/stick for that flight function. Press **"F5(Next)"** to confirm.
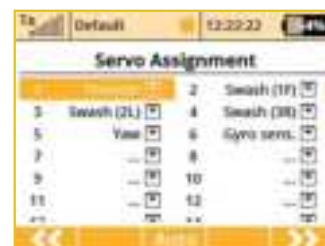
7. The **„Servo assignment"** menu displays the receiver channels and their transmitter output assignments. If you want to change any of the output assignments, select the channel you want to edit and reassign its output. Otherways press **„F5(Next)"** to confirm.

8. The *"Swash Mix"* menu displays the travel range of each particular helicopter flight function for the swash plate for flybarred helicopters. The travel range is displayed as a percentage. You can use these travel range adjustments to prevent linkage binding and to tune the helicopter to suit your flying style. You can also activate a cyclic reduction of the rotor head travels (Swash Ring) so the servos cannot be damaged by large simultaneous movements of the sticks.(Refer to your helicopter's instruction manual.) Press the **"F5(Next)"** button to confirm.

9. The screen will display a question which asks if you really want to create and activate the new model. Press the **"F5(Yes)"** button to confirm.

10. The **"Servo Setup"** menu is where you can set all of your servo neutral positions, servo output throw limits, servo reversing, delay etc. You should return to this menu after you have bound your receiver and transmitter. *See chapter 8.3: Receiver->Binding.*

11. Once your transmitter has been bound with a receiver and has been connected to its power supply, the last step consists of tuning the servo output functions, *see chapter 7.3.5: Setup of receiver outputs.*

In the **"Fine tuning -> Flight modes"** menu you will setup these advanced model control functions for your helicopter:

**Collective pitch curve**, see: *Fine tuning -> Flight Modes->Function Curves*

Throttle curve, see: *Fine tuning -> Flight Modes->Function Curves*

Dual rates, see: *Fine tuning -> Dual Rate/Expo*

Autorotation, see: *Fine tuning -> Flight Modes*

Gyro/Governor see: *Fine tuning -> Gyro/Governor*

For convenience, a quick link to all of these function settings has been made through the Heli Tuning menu.
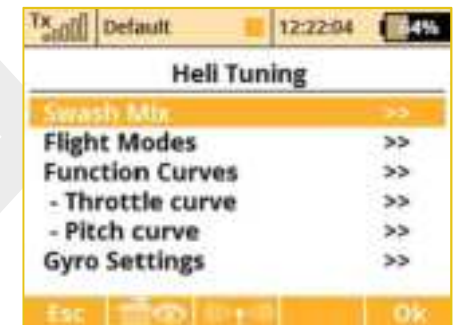
7.3.3 Multicopter

The DS-12 transmitters allow you to simply create a multicopter model equipped with gear and camera gimbal. By default, after the creation of a multicopter model, the digital trims are disabled.

Servo assignment to receiver channels:

1. Throttle
2. Roll (ailerons)
3. Pitch (elevator)
4. Yaw (rudder)
5. Mode (multicopter mode channel)

Before you begin creating a model, make sure that you have setup the correct transmitter mode in *„Main menu -> System -> Configuration -> MODE 1-4"*. The basic, standardized, assignment of transmitter inputs to flight controls are based upon this selection.

First it is necessary to create a model in the transmitter and then bind the DS-12 transmitter with the receiver which will control the given model. *See chapter 8.3: „Receiver->Binding"*
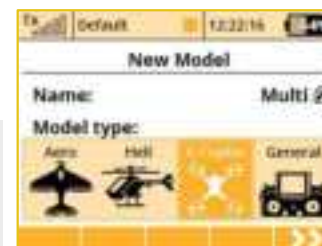
Note: For safety reasons we strongly recommend removing the propellers when working with a multicopter model.

1. Switch-on the transmitter. In the main display push the key *„menu"*. Select the item *„Model"* and push the *„3D button"*.
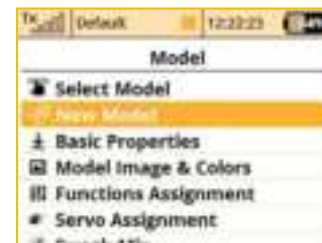
2. Select the item *„New model"* and push the *„3D button"*.

3. Enter the name of your model and press *„F5(OK)"* (Note: you must enter a model name to proceed.) Then select the model type *„X-Copter"*. Confirm by pushing the *„F5(Next)"* button.

4. Choose an optional model image and color profile according to your personal preferences. The images must be loaded to the internal SD card before you use them. You can skip this step by pressing *„F5 (Next)"* button.

5. Select the basic properties of your multicopter, i.e. type of camera gimbal (off, two axes or three axes), number of gyro tuning functions and gear servos.

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6. This page displays the flight control functions and their transmitter switch assignments. Here you can verify that your flight control functions are correctly assigned to the transmitter switches/sticks. If they are not, check and make sure that you have selected the proper transmitter mode. Confirm the assignments by pushing the **„F5(Next)"** button.
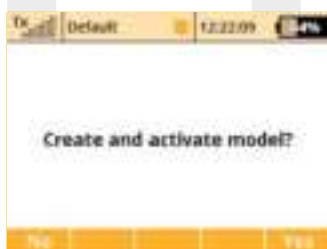
7. This page displays the assignment of functions to your receiver outputs (servos). You may change the assignments by editing the output assignment for each receiver channel. Otherways confirm with the **„F5(Next)"** button.

8. The screen will now display a request which asks if you really want to create and activate the new model. Confirm with the **„F5(Yes)"** button.

9. The Servo Setup menu is where you set the servo neutral positions, servo output travel limits, servo reversing, delay etc. You will come back to this menu after binding the receiver with your transmitter. Press the **„F5(OK)"** button and you are taken to the main screen where your new model is displayed in a desktop page.

10. Bind transmitter with the receiver, **see chapter 8.3 *Receiver->Binding***. Once your transmitter has been bound with the receiver and you have re-applied power to the receiver, the last setup phase is the tuning of your flight controller channels, **see chapter 7.3.5 Setup of receiver outputs.** Set the correct subtrims and endpoints, so that the flight controller unit recognizes the channels as valid.

7.3.4 General

The DS-12 transmitters are not only equipped with the assistants for airplanes or helicopters, but they also have a „General" assistant which can be used to create just about any other type of model. If your model cannot be assigned to the category of an airplane or helicopter, select the general model. The following setup describes the creation of a boat model. This process could also be used to create a profile for any other land/water/air model craft. In this example, the model is controlled by basic functions like throttle and rudder as well as by extended functions like a motor sound generator, lighting system, siren, and a smoke generator. The first three above mentioned functions are controlled proportionally and the rest are non proportional.

Servo assignment to receiver channels:
1. Motor
2. Rudder
3. Motor Sound Module
4. Lighting System
5. Siren Sound Module
6. Smoke Module

Before creating a model, make sure that you have setup the correct transmitter mode in "**Main menu -> System -> Configuration -> MODE 1-4**". The basic, standardized, assignment of transmitter inputs to flight controls are based upon this selection. First it is necessary to create a model in the transmitter and then bind the DS-12 transmitter with the receiver which will control the given model, **see chapter 8.3: "Receiver->Binding**".

1. Switch-on the transmitter. In the main display push the key *„menu".* Select the item *„Model"* and push the *„3D button".*
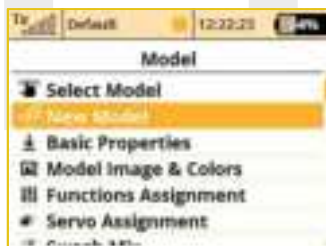
**2.** Select the item *„New model"* and push the *„3D button".*

3. Enter the name of your model and press *„F5(OK)"* *(Note: you must enter a model name to proceed.)* Then select the model type *„General".* Confirm by pushing the *„F5(Next)"* button.

4. Choose an optional model image and color profile according to your personal preferences. The images must be loaded to the internal SD card before you use them. You can skip this step by pressing **"F5 (Next)"** button.

5. The first item in the **"Basic Properties"** menu is the number of motors in the model. In this example, this item will not be edited and we will proceed to the second item, which is how the motor needs to be controlled – i.e. whether the motor turns only one direction (Single) or both directions (Double). Edit the item **"Motor type"** by selecting **"Double direction".** Press the **"F5(Next)"** button to confirm.
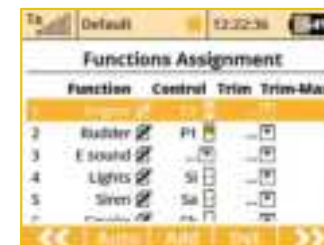
6. In the **"Function Assignment"** menu use the **"F3(Add)"** button to create all of your desired functions. Then you can assign transmitter control switches/sticks to the functions by editing each function's **"Control"** item, see chapter: **"Select control input".** The only exception is the motor sound module function, which you cannot simply assign to a control switch/stick, because it wil be controlled by a mixer. The mixer will allow the motor sound will be played proportionally to the motor speed. For the siren function you may take advantage of the switch **"Sa"**

(spring-loaded switch). After you create all of your desired functions, press the „**F5(Next)**" button to confirm.

7. The **"Servo assignment"** menu displays the receiver channels and their transmitter output assignments. The channels are assigned in the order that you created the functions in the previous menu. If you want to change any of the output assignments, select the channel you want to edit and reassign its output. Otherways press **"F5(Next)"** to confirm.

8. The screen will display a question which asks if you really want to create and activate the new model. Press the „**F5(Yes)**" button to confirm.

9. The **"Servo Setup"** menu is where you can set all of your servo neutral positions, servo output throw limits, servo reversing, delay etc. You should return to this menu after you have bound your receiver and transmitter. *See the chapter 8.3: Receiver->Binding.*

Once your transmitter has been bound with a receiver and has been connected to its power supply, the last step consists of tuning the servo output functions, *see chapter 7.3.5: Setup of receiver outputs.*

To complete this model we just need to configure a free mixer from the throttle function to the motor sound module. In this example we will set a switch to enable/disable the mixer so that when the switch is **"on"**, the motor sound module is controlled with the throttle (motor speed). Go to the *"Fine tuning->Free mixers"* menu.

a. Use the „**F2(Add)**" button to create a new mixer. Select „*Engine*" in the „*From*" item. Then select „Sound M" (the name of the sound function) in the „To" item. The item „*Master Value*" represents the amount of mixing from the input function to the output function for this mixer. With the „**F5(Next)**" button you will create the mixer and the display will change to show the overview of your programmed free mixers.

b. To assign a switch for the activation and deactivation of the free mixer, press the **"F4(Edit)"** button. Select and edit the **"Switch"** item to assign a switch/stick to enable/disable the mixer.

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7.3.5 setup of Receiver Outputs

Go to the **"Model->Servo Setup"** menu. Use the **"F2"** and **"F3"** buttons to brows through the receiver outputs (channels).

You can scrol through the following servo adjustment items for each channel:

„Servo reversing" – reverses the servo throw direction.

Move the stick for your selected channel and observe the direction of the servo movement. If the servo moves in the opposite of your desired direction, change the direction by editing the „Reverse" item for that particular servo. Continue with each channel until all of theservos travel in the required directions.

„Center (Subtrim)"- adjusts the center position of each servo's output.

With your sticks in their neutral positions, scroll through each servo's page and use the "Center (Subtrim)" item to correctly set all of your servo's center or neutral positions.

> **Note:** **You should mechanically adjust all of your servo arms and servo linkages to be as close to neutral or center as possible so that you will need as little subtrim as possible. Using large amounts of subtrim can limit the overall throw of your servo.**

„Max/Min. limit" – sets the absolute maximum servo output throw

Use these to limit the maximum range of servo throw in order to keep your servos from exceeding their mechanical limits or to keep your servos from binding when moving their arms or linkages to their full travel. You should use the dual rate function to set your model's useable control throws.

⑧ Receiver

8.1 Description
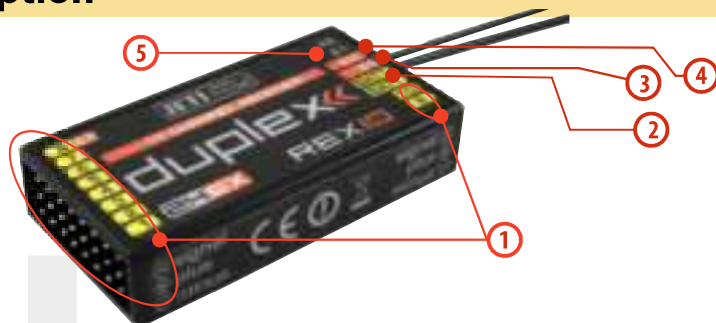
1. JETI Duplex receivers use the universal or „JR Type" servo connectors.

2. **Bat -** receiver and servo power supply input. Whenever possible, always supply power to your receiver using more than one of these inputs. You can either supply power through the use of a Ycable or through any unused receiver channel connection. To power the receiver you may use NiCd packs, the BEC from your ESC or Li-xx cells used with a voltage regulator, such as the JETI MAXBEC or similar.

3. **SAT** - auxillary input/output for PPM signals. This input allows you to connect an additional JETI DUPLEX Rsat2 satellite receiver or an additional US version Duplex receiver.This allows you to increase the number of receiver antennas in your system for increased reliabilty in installations with shielded or badly oriented antennas.

4. **EXT** - input for telemetry sensors. If you want to connect more than one telemetry sensor then use the JETI EXPANDER E4. You can „daisy-chain" several of the E4 Expanders to support many, many sensors.

5. **A1/A2** - receiver antennas. The antennas should be installed so that the wires form a 90° angle relative to each other.

8.2 Installation

Whenever possible, you should wrap the receiver in foam and place it as far as possible from sources of interference (servos, electric motors). Arrange the receiver antennas so that their active ends forem a 90° angle and try to put them as far as possible away from each other. Take care not to bend them with a radius smaller than 1 cm. The active part of the antenna should not be placed close to metal parts. If your model has a carbon fuselage it is very important to place the active antenna ends outside the fuselage.

8.3 Binding

In order to achieve communication between transmitter and receiver you must bind them. During this process the transmitter learns the receiver address and will automatically find it again when switched back on. Communication begins with this receiver automatically if the transmitter is not already communicating with another receiver. The binding process needs only to be done once for each receiver.

8.3.1 Standard pairing procedure

1. Switch off the transmitter and receiver.

2. Plug the **„BIND PLUG"** into the **EXT** receiver input.

3. Connect receiver power supply.

4. Switch on the transmitter. The receiver will bind with the primary transmitter module.

8.3.2 Alternative pairing procedure through the transmitter menu

1. Turn off the receiver. Keep the transmitter turned on.

2. Plug the **"BIND PLUG"** into the EXT receiver input.

3. Connect receiver power supply.

4. Locate the transmitter menu **„Advanced Properties -> Wireless Modes/Trainer"**

5. Highlight **"Pair primary TX module"** and press the **„3D button".**

6. The receiver will bind with the transmitter. Confirm the registered device.

8.4 Range Test

The range test will verify that the transmitter and receiver are functioning properly.

Before the first flight of each flying session or if have any doubts about the transmitter or receiver function, you should always check the range. During the range test the transmitter's output power is decreased to 10%.

When performing a range test, both the model and the transmitter should be at a minimum height of 80 cm (31.5") above the ground. A correctly functioning transmitter and receiver in range test mode should safely control a model to a minimum distance of 50m (164'). If not, check your model's antenna installation first. If the test is still not successful, don´t fly the equipment and contact your retail shop or one of the JETI authorized service centers.

8.5 Fail safe

All Duplex 2.4GHz system receivers are equipped with **"fail safe"**, a function which reacts to control signal transmission interruptions. When your receiver for any reason does not receive transmitter information, it changes, after a pre-set time period, to one of the following modes.

„Repeat" – This mode holds the last valid control throw signal (this is the default mode for all receivers)

„Out off" – There is no output signal provided by the receiver, i. e. servos do not keep their positions

„Failsafe" – receiver outputs change to preset positions

duplex **2HEX** computer radio control system **EN**

Each receiver channel can be configured to one of the modes described above. We recommend that you setup "fail safe" positions for every output, which enables your model to stay in a stable condition. For instance, the elevator and rudder in neutral positions, electric motor switched-off, gas engine idling, spoilers extended.

Configuration Method of the receiver failsafe function.

1. Bind receiver with transmitter. *See chapter: 8.3 Binding*. Leave receiver and transmitter in switched-on condition.

2. In the transmitter, go to the menu *„Applications -> Jetibox"* and proceed according to picture. Use the **F1-F4** function buttons to move within the menu.

3. In the *„Set Output Pin"* menu select the receiver output which you want to configure (use the left/right buttons) and proceed (by using the down-button).

4. In the **"Signal Fault Yn"** menu where n denotes the channel number which has to be configured, use the right-button to edit the output function showing a signal failure (setup "fail safe"). You have now activated the **"fail safe"** function on receiver channel output n.

5. The **"fail safe"** is adjusted by pressing the down-button and changing to the *„fail safe"* menu. With the left/right buttons edit the "fail safe" value in a range of 0.8ms to 2.2 ms. Adjust all of the connected receiver outputs by repeating steps **3-5**.

The last parameter to be set up is the elapsed time after signal failure when the **"fail safe"** or other actions after signal failure will be initiated. In the **"SignalFault Delay"** menu you can define the length of time after a signal fault occurrs in which the preset throws are applied. The values in this menu are changed by pressing the left/right buttons.

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8.6 Using Device Explorer To Configure the Receiver

The Device Explorer utilizes the latest data/command **EX Bus** protocol to wirelessly configure remote devices such as receivers, sensors and other **EX Bus** compatible devices. You can check the label of your device to see if it supports the **EX Bus** protocol.

Basically, the Device Explorer (located in the Model menu) replaces the integrated JETIBOX emulation and brings additional, more intelligent ways to communicate with your remote devices. The main Device

Explorer window shows a list of available devices. The recognized devices are labeled with their registered name, others are not displayed or only displayed as a device ID. The check mark tells you that the device is ready and that you can configure it. By using the **"F3" Refresh** button you can reset the displayed devices, this forces the auto-detection function to explore all attached devices. The remote sensor and device detection process is always running in the background.

In the picture above, two receivers have been detected and are recognized. When you press the rotary button, you are able to configure them in detail. Here is the example how to use the Device Explorer to configure an **"R9 EX"** receiver:

First, the transmitter downloads all settings from the receiver. After that operation is completed you should be able to see the basic configuration of the receiver as shown in the picture **a)**. Every modification that you make is automatically uploaded back to the receiver, so that you can immediately see results of the steps you are

doing and there is no need to continuously **"save"** your changes. For your convenience, there is a **"Refresh"** button **"F3"**, which causes all of the data to be downloaded from the receiver once again. This is beneficial mainly if you are modifying the configuration by using a JETIBOX device and the Device Explorer simultaneously.

The **"F2"** Tools button is used to enter a special dialog where you can import and export settings of the particular device. If you want to export the configuration of your (for example) receiver, just enter the **"Export settings"** menu item, set the file name and confirm. Similarly you can import this configuration to the device. All the exported files are stored in the **"Export"** folder on the SD card.

Note: Before a device can be recognized, a special predefined configuration scheme must be present on the SD card in the /Devices folder. If the scheme doesn't match or doesn't exist, an error message "Unknown device" is displayed. If such an error occurs, please download the latest software for your DS-12 which, by default, has all the definitions included, or contact your dealer for assistance. This text describes properties introduced in receiver version 3.20.

*The picture **a)** shows the following adjustable parameters:*

- ***Serial Link*** – This determines the operational mode of the receiver. You can choose from these options:
    - **• JETIBOX & Servo** – The standard mode for direct servo control.
    - **• PPM Positive, PPM negative** – the servo signal is summed into a standard or inversed PPM signal. This option is for devices which can use single line servo output data. Direct connection of servos in this mode is supported as well.
    - **• EX Bus** – Tells the receiver that it should send all data onto a fast digital serial link for further processing. This is the recommended option if you are connecting the receiver to the Central Box or another **EX Bus** intelligent device.
    - **• UDI - Universal Data Interface.** - This is a unidirectional digital serial protocol that can transmit up to 12 channels on a single wire. The UDI is compatible with several stabilization systems for helicopters and airplanes.
- *-General Settings* - redirects you to screen **b)**
- *- Fail-Safe* - redirects you to screen **c)**
- *- Alternative Pin Config* - redirects you to screen **d)**
- *- Receiver Outputs* - redirects you to screen **e)**

*- **Reset to factory defaults...*** – After confirmation, the receiver's configuration will be restored to its factory settings.

*The next page (General Settings) shows basic properties of the receiver (picture **b)**.*

b)
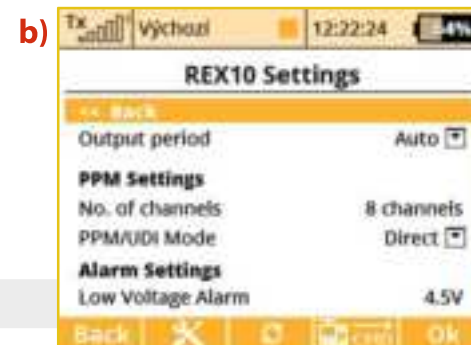
*- **Output Period*** – Determines how often the servo signal will be repeated to the outputs of the receiver. You can select periods from 5ms to 30ms (in 5ms steps). Recommended option: „*Auto*".

PPM Settings

*- **Number of channels*** – if the output mode selected is either positive or negative PPM, you can set how many channels will show on the output.

*- **SAT1/SAT2*** - Some types of receivers support input of backup PPM signal. This signal can be captured via SAT1 or SAT2 ports. Here you can define the mode of operation for the particular ports. The PPM input can be accepted only in standard servo mode and EX Bus mode. Additionally, the SAT2 port can be configured as a PPM output. In this case the SAT2 outputs all 16 channels if not specified otherwise.

- PPM/UDI Mode - determines processing and additional logic applied to the PPM and UDI protocols.

- Direct - signals received from the transmitter are not further on processed in the receiver, they are generated without any change at the output of the receiver in form of PPM/digital signals. If a signal loss occurs, no PPM/digital data will be generated by the receiver.

- Computed - the signals received from the transmitter can be processed further on in the receiver and its menus "Channel set" and "Out Pin Set" programmable channel outputs, gains etc.)

Alarm Settings

- Low Voltage Alarm - the value serves for the setup of the alert decision threshold. As soon as during operation the actual voltage decreases below the set threshold, the receiver will generate an alarm. The transmitter may announce this situation by an acoustic tone (this depends on transmitter alarm settings, please refer to chapter describing **"Timers/Sensors -> Alarms"**).

On the next page (picture **c)**) shows the fail-safe function parameters.
- Fail-Safe – This parameter tells the receiver how to react when a signal loss event occurs. If you set **"Enabled"** then you will be able to set the behavior of every channel independently. The **"Disabled"** option says that if no signal is being received from the transmitter, no driving signal for the servos (or PPM) will be present.
- Fail-Safe Delay – The number of seconds that must elapse from the

moment of losing signal until the fail-safe is activated. This option is available only if the Individual mode is selected.
- Each output position of the receiver has three adjustable parameters:

c)

• **Mode (Hold, Out OFF or Fail-Safe)** – Dictates, how the specific output behaves if a signal loss occurs. Using the Hold mode, the latest known servo position will be held. Out Off option means that there will be no signal to the particular servo channel. The last option, Fail-Safe, will set the servo to (user) predefined position (set in the **"Value"** column).

• **Value** – The position of the servo after a signal loss occurs. This is available only when the Fail-Safe mode is selected. For convenience, you can press the **"F4 Apply"** button while you are editing this column. The selected value will then appear directly on the servo output without the need to turn off the RF modules which would eventually activate the fail-safe and show the set position. The **"Apply"** function makes it faster to set your fail-safe positions.

• **Slope** – This slows down the speed of servo movement while the output is moving from the normal position to the fail-safe position.

The screen **d)**, **"Alternative Pin Config"**, allows you to modify the modes of receiver output pins. The servo outputs can be configured into Digital input and Digital output modes.

d)

- Digital input mode: a logical value of a given signal pin (0 or 1 as a result) is transmitted to the DS-12 in form of EX telemetry so that it can be further on processed (displayed and stored to the SD card). The receiver pins are equipped with internal pull-up resistors. To detect logical value of a given pin it is enough to connect the signal pin with the ground.

- Digital output mode: The channel value of a given output pin is discretized into two values. If the channel value is greater than 1.5ms, the pin output will be log.1. Otherwise the signal pin will stay at logical 0. Using this way you can simply control for example lights consisting of several LEDs. The fail-safe configuration is applied in this mode as well as in servo mode.

The page Receiver Outputs (**picture e**)) allows you to redirect your transmitter's channels to any output of the receiver. For convenience the transmitter's channel numbers are displayed together with the appropriate function names, making it easier to adjust. In addition, you can also set the servo group for each channel. For more information please refer to your receiver manual.

e)

8.6.1 Support of remote commands for EX Bus devices

The DS-12 transmitters support up to 16 universal commands for wirelessly connected devices supporting EX Bus. To view the list of active commands, press the **"F4" CMD** button when in the **"Model -> Device Explorer"** menu. However, the command must be detected before it can be activated. As an example of the use of wireless commands, the Central Box can be used and its command that resets the minimum, maximum values and battery capacity (**Clear MIN / MAX values**).

1. The list of active commands.

2. Sa switch is assigned to reset minimums, maximums, and the measured capacity. For the reset command only the Control mode is available (the position of the control/switch is taken as an input), other devices may accept a proportional value specified as a constant or as the channel number on the transmitter.

3. Scroll to view minimums and maximums.

4. Pushing the **„3D"** button enables you to add the command into the list of active commands and it is possible to assign a transmitter control to it.

On the main screen of the Central Box settings scroll down to display the maximum telemetry values (Telemetry Min/Max). Here you will find a choice to assign a switch to the command for deleting measured minimums and maximums (Clear Min/Max switch). Pushing the **"3D" button** on this item you are moved to the list of active commands where this command is already listed and is inversely highlighted with a cursor.

Pushing the **"3D" button** moves you to the choice to assign the control/switch that will further on take care of the command for resetting. Here we have chosen the **Sa** switch.

Further operation of the command will look like this:

- Moving the **Sa** switch into the **ON** position makes the transmitter detect that it should send the command for resetting telemetry minimums and maximums to the model. However, before the command is applied, it is necessary to confirm the choice by the pilot to avoid unwanted resetting of the data.

- The transmitter displays a dialog asking if you want to execute the command for resetting the telemetry. If you press **NO** or you do not manage to respond in time, the dialog closes and the command is not executed.

- Conversely, if you press **YES**, the command is sent to the model where it is processed by the Central Box which resets its telemetry. The result of this command can be displayed on the main screen of the transmitter in the telemetry window – the item Capacity of the Central Box will now be set to zero.
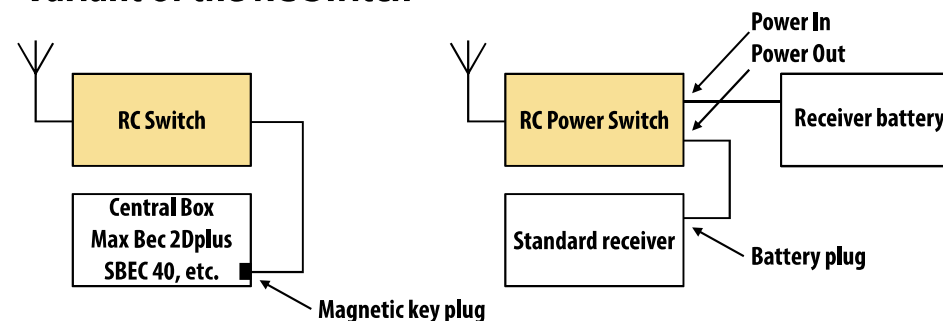
8.7 RC-Switch

The RC Switch is a special wireless device that allows you to remotely connect or disconnect the receiver power supply of your model. There are currently two variants of the device: RC Switch and RC Power Switch. The difference is noticeable in the picture below. The simple **RC Switch** is suitable for applications where a **Central Box, Max Bec 2D plus, SBEC 40** or other intelligent electronic device is being used. It offers a single output pin that might be wirelessly driven high or low according to the situation.

When connected in place of a magnetic key, the RC Switch can turn the electronics in the model on and off.

The second variant, the RC Power Switch, can fully replace a standard physical switch. It can directly drive servos and electronics since it includes a couple of low-resistant MOSFETS. Just plug the RC Power Switch between the battery and the receiver, configure the switchrelated settings in your transmitter and bind it as a standard receiver.

Variant of the RC Switch

The switch-related settings are located in *Model-> Device Explorer -> RC-Switch*. First, you have to enable the switch by pushing the rotary button on your transmitter with the first row of the transmitter display highlighted.
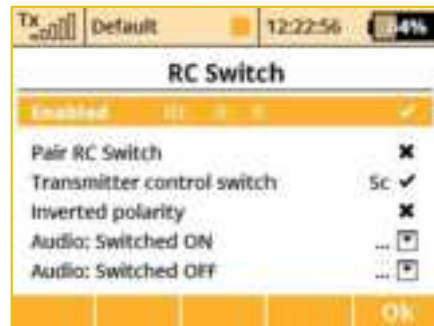
Then you should bind the RC Switch:

- Put the bind plug into RC Switch and then turn it on.
- Push the rotary button with the ***"Pair RC Switch"*** row highlighted on your transmitter display.
- The ID of the switch is automatically saved.

The Transmitter control switch function is a source of events:

If you want to turn the model on, then flip the assigned control switch and confirm the question that appears. If you want to turn the model off, just flip the switch back and also confirm the question.

You can invert polarity of the switch (if high logical level doesn't turn the device on) and also set the audible signals that will be activated every time the status of RC Switch is changed (turned on or off).