JETI model®

CZECH REPUBLIC

duplex

DS-12

2.4GHz & 900MHz NG

Dual Band System

FW 5.00

EN

ver. 2.0 - 2020-09, FW ver. 5.00

The following chapters are only included in the electronic version of the manual. The complete manual is available on the SD card of your transmitter or on site www.jetimodel.com.

① Introduction

1.1 DS-12

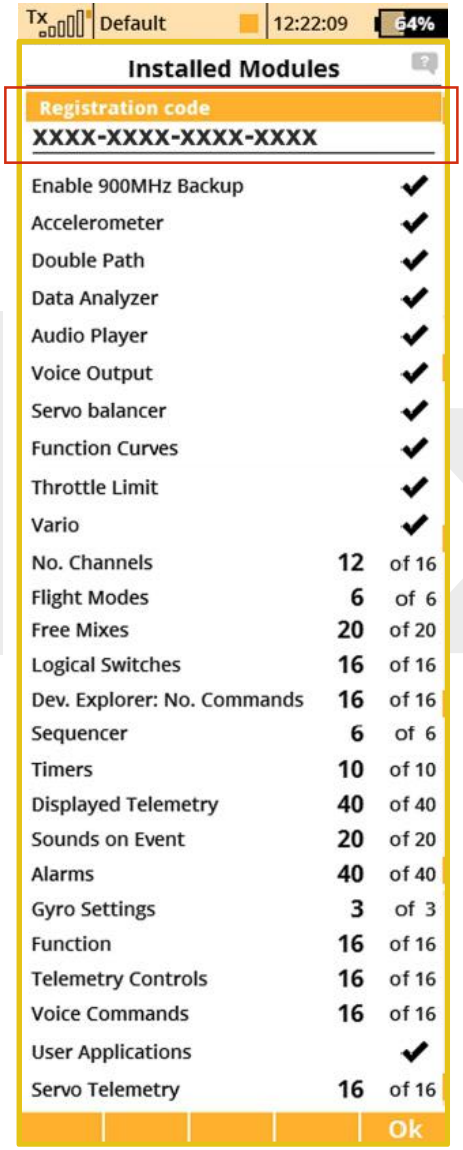
The DS-12 transmitter was developed and produced with the cooperation of professional engineers and world champion pilots. The design goals were maximum utility, durability, and reliablity of their mechanical parts along with simple handling. The straightforward case shape makes servicing easy. The plastic, ball bearing equipped, control gimbals with their magnetic Hall sensors are another revolutionary design concept used to make the DS-12 among the world's most advanced R/C systems.

Purposefully placed at the top of the transmitter, the 3.5" sunlight readable color LCD with its wide viewing angle offers nearly perfect visibility in just about any lighting condition. Thanks to its high resolution display and use of a relatively large number of graphic images it was possible to create a simple and intuitive setup procedure for displaying telemetric data.

The DUPLEX EX family of products have been equipped with an improved real-time telemetry system which can be viewed on the LCD transmitter display. The transmitter allows the setup of voice notifications, both preinstalled and user created, which can be related to telemetric values, user set alarms, or signals which have been assigned to conditions of various control elements.

The DS-12 offers concept of individual feature setup based upon the requirements of each customer. The transmitter is available in a basic configuration that will meet the needs of most users for most model types. For individual setting of the transmitter there is a configurator available at **swshop.jetimodel.com**. After the simple registration of your transmitter it is possible to select additional features based upon your individual demands.

1.2 Activation method for software modules of JETI model



1. Make sure you have the most current firmware version in your transmitter.

2. Register on the site **swshop.jetimodel.com**.

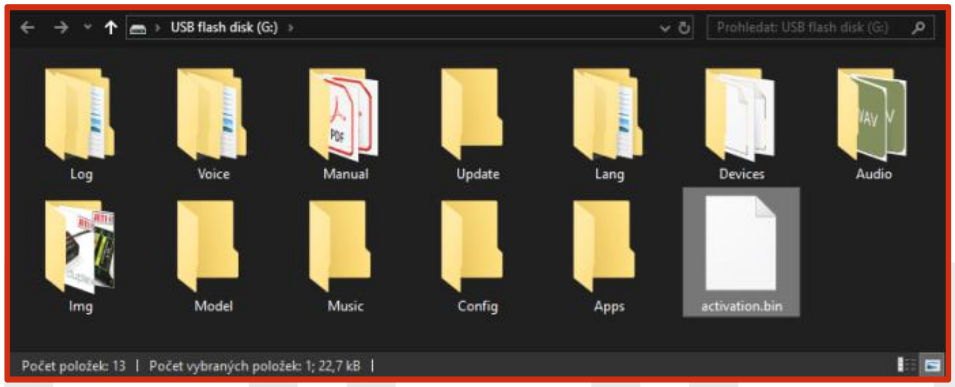
3. After clicking on the ***„Register new product"*** button you will be redirected to a form where you enter a product type **(DS-14)**, followed by the ***„serial number" (SN: xxxxxxxxx)*** *(to be found on the back of the transmitter behind the screen)* and then enter the ***„16 digit registration code" (xxxx-xxxx-xxxx-xxxx)*** (see the menu ***„System -> Installed Modules"*** highlighted by the frame). After registering your transmitter, you can select individual function modules that you want to activate.

4. Mark selected modules and proceed to checkout.

5. Then you will be asked to pay

the relevant amount. After payment, a unique nontransferable file named ***"Activation.bin"*** will be generated. It will then be sent to your e-mail.

6. Connect the DS-14 to your computer and enable USB mode.



7. Copy the ***"Activation.bin"*** file to the transmitter SD card into the root folder. The contents of the transmitter SD card can then look like this:

8. Disconnect the transmitter from the computer (Do not forget to confirm the safe hardware removal). Then confirm in your transmitter that you want to update and restart it.

If the activation is successful, an informative table with a list of modules appears immediately after switching on. Then it is possible to operate the transmitter as usual.

1.3 Features

Duplex 2.4GHz – the DS-12 transmitters feature the Duplex 2.4GHz, frequency hopping, digital, data stream system, originally developed by JETI model in the Czech Republic. This system has been reliably used for many years.

Duplex 900MHz NG (Next Generation) - the DS-12 transmitters feature a backup wireless system for unmatched data transmission safety and reliability.

Built-in Telemetry – from the start, the DS-12 transmitters were designed and built with many attractive features and include the full integration of all Duplex telemetry sensors.

Transmitters - the DS-12 designs use premium quality materials and emphasize state-of-the-art appearance and user comfort.

Precise Gimbals – the transmitter gimbals are equipped with Hall sensors and ball bearings for precision movement with an almost unlimited lifespan.

Haptic feedback - the transmitter are equipped with shaking vibration motor that can be used for alarm notifications, timers etc.

LCD Display – color 3.5" TFT LCD display with 320 x 240 resolution which is highly visable under any light conditions.

Li-Ion Battery – provides a proven and reliable energy source with a high capacity (6200mAh) and a long service life.

Easy Charging – simply connect the wall power supply, optional car charger, or any 12V DC power supply to the transmitters charge port. The DS-12 may also be charged through the USB to PC interface. The charging progress is shown on the DS-12 display.

Integrated Antenna – the antennas are located behind fully integrated cover in the DS-12 case for protection against mechanical damage.

Large Memory – Internal SD card for storing models, sounds, and telemetry data.

USB Connector – convenient connection to your PC. Fast firmware & sound upgrades, telemetry data downloads.

Fast Navigation – 3D wheel-style interface combined with function keys allow for speedy navigation within the DS-12 menu.

Digital Trims – fully programmable trims and a revolutionary automatic trimming function.

Swappable and Assignable Switches – all of the switches on the DS-12 transmitters (2 or 3-position) can be easily moved and assigned to create a custom configuration that works best for your application.

Programming – the logical and intuitive transmitter firmware is designed to be simple to use. Just follow the step-by-step screens. The creation of a new model can be accomplished with just a few easy steps.

Sounds/Alarms – the DS -12 transmitters are equipped with audible alarms and also allows the use of user-recordable alarms and sounds to keep you fully informed while also keeping distractions to a minimum.

Integrated microphone with voice recognition capability - using the integrated microphone you can easily prepare your own audio files. Furthermore, you can teach the transmitter to respond to several voice commands.

1.4 Manual Navigation

Important parts of the instructions are separated from the text andhighlighted according to importance.

Advice	*Note*	*Warning*

Advanced modelers may want to begin with group 3 where you will get all of the basic information for model setup. This is the quickest way to understand the basic ideas of the DS-12 transmitter programming and with this basic information you can begin to create your own model. More advanced programming functions are found in group 4. This is where you can find detailed descriptions of all of the DS-12 functions. The last section provides detailed description of firmware upgrades, downloads, and special mixes.

1.5 Technical Support

If you feel uncertain about how to set up particular transmitter functions, do not hesitate to take advantage of our technical support:

1. Web Site

Either the JETI model (manufacturer) or your local distributor's web sites offer a wide range of support for the DS-12 transmitters. You will find advice, tips or frequently asked questions (FAQ) which, in most cases, contain the answers to your questions.

2. Distributor, Manufacturer

You may also find support at your local hobby shop, distributor, or directly with the manufacturer JETI model s.r.o.

3. Service and Warranty Coverage

JETI model CZ exclusively warranties that the products purchased will be free from defects in materials and workmanship for a period of 24 months from the date of purchase by the customer. This warranty covers only those products purchased from an authorized JETI model CZ distributor or dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for warranty claims. Repair or replacement decisions are at the sole discretion of JETI model CZ or an authorized service provider. This warranty does not cover cosmetic damage or damage due to an accident, misuse, abuse, negligence, commercial or research use, or modification of or to any part of the product. This warranty does not cover damage due to improper installation, operation, maintenance, or attempted repair by anyone other than JETI model CZ or an authorized service provider.

JETI model CZ reserves the right to change or modify this warranty without notice and disclaims all other warranties, expressed or implied.

1.6 DS-12 Package Contents

1. JETI DS-12 Transmitter, **2.** Wall Power Supply, **3.** USB PC Cable, **4.** Installation Key Set (HEX 1,5; TORX 10), **5.** Cleaning Cloth, Instruction Manuals,

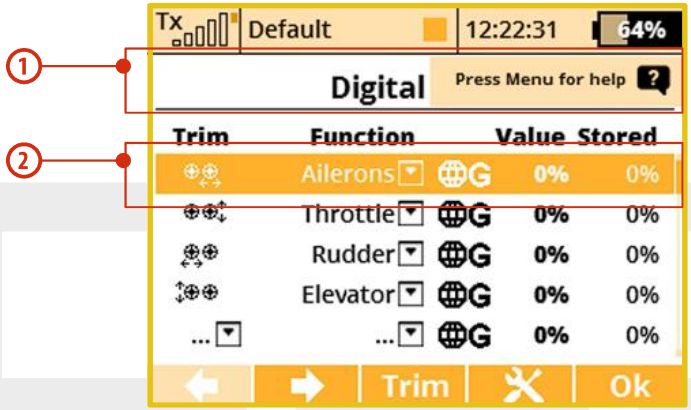
2 System Specifications

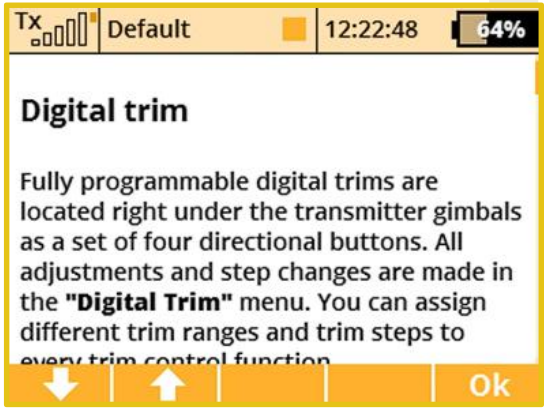
Basic technical parameter	DS-12
RF module 900MHz (863-870 MHz - EU) (902-928 MHz - EU)	❍
Stick material Multimode	Plastic
Resolution of sticks	4096
Sticks HALL sensors	●
Internal memory, SD cart	8 GB
RF modul 2.4 GHz	1
Number of antennas	3
LCD	3,5" 320x240px color high contrast
Weight [kg]	0.7
Dimensions [mm]	194x215x55
Battery pack [mAh]	Power Ion 6200

❍ **Extension** ● **Contains**

3 Help mode

It is possible to call up the help mode for each item where a **"question mark"** icon appears in the upper right corner of the screen **(1)**. If you see this icon, you can press the ***"menu"*** button briefly to call up the help mode for the current item you have highlighted in the respective transmitter menu **(1)**.





This help mode is available in FW min. v5.00. We recommend update your transmitter by Jeti Studio.

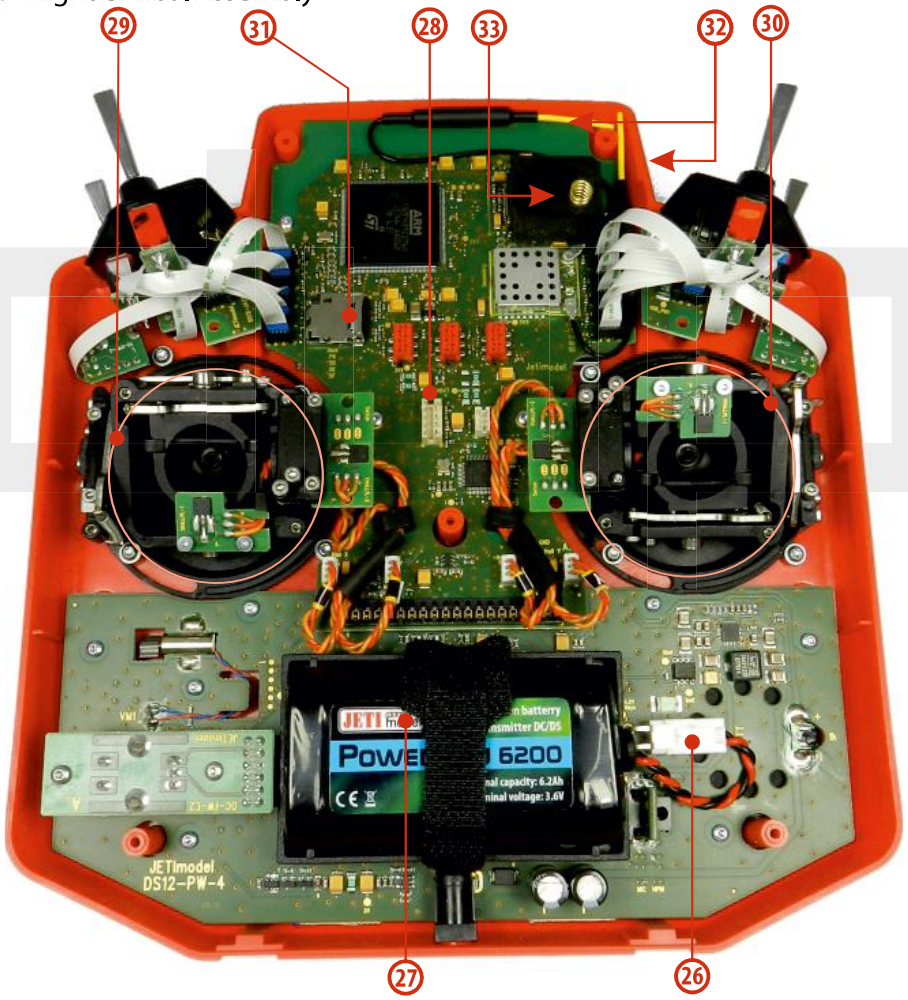
4 Description of Transmitter DS-12

4.1 Control Identification DS-12

1. Right Stick 1, 2 – the DS-12 Transmitter Supports Modes 1-4, see ***Control Sticks -> mode change***
2. Left Stick 3, 4 the DS-12 Transmitter Supports Modes 1-4, see ***Control Sticks -> mode change***
3. Swappable and Assignable Switches: Sa, Sb, Sc, Sd, Se, Sf
4. Digital Trims for the Left Stick T3, T4
5. Digital Trims for the Right Stick T1, T2
6. Right Rotary Control Knob 5
7. Left Rotary Control Knob 6
8. Rotary Control Knob 7
9. Rotary Control Knob 8
10. LCD Display
11. Function Buttons F1 – F5
12. Transmitter On/Off Power Switch
13. 3D Control Selector
14. Menu Button
15. ESC Button
16. Shows the 2.4GHz Antenna but NOT the handle.
    Add the handle and assign it a number and pointer in the photo.
17. Charge Jack
18. USB PC Interface
19. PPM Input/Output
20. ON/OFF & Charging LED Indicators
21. Speaker
22. Neckstrap Hook
23. Earphone Jack
24. 900 MHz Antenna
25. Microphone

4.2 Assembly Identification

26. Battery Connector
27. Transmitter Battery Pack
28. PPM Output Connector
29. Left Gimbal Assembly
30. Right Gimbal Assembly
31. Micro SD Card
32. 2.4GHz Antennas
33. 900 MHz Antenna



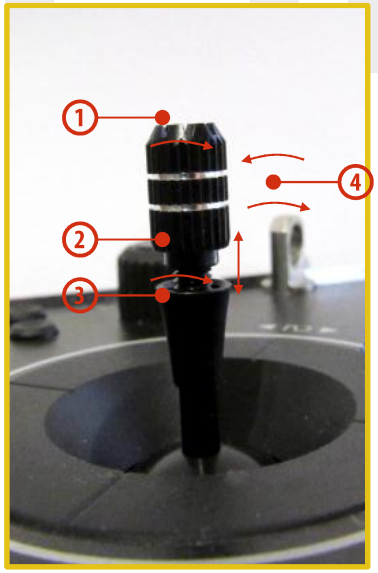
4.3 Control Stick Assembly

Note: ***When handling with back cover removed always switch off the transmitter and disconnect the battery (unplug the connector). Also do not connect the charging adapter or the USB cable.***

Warning: ***Restrict your contact with the printed circuit boards to a minimum. You can damage your radio by electrostatic discharge!***

4.3.1 Control Stick Length Adjustment

The stick length is adjustable to suit your flying style. The stick end separates into two parts.



1. Hold the top part of the stick and firmly and unscrew (turn it anticlockwise).

2. Turn the stick end clockwise to shorten or counterclockwise to lengthen the overall stick length.

3. Adjust the lower part to support the top part of the stick end.

4. Finally secure by tightening both parts to each other.

Warning: ***If you have installed optional sticks with switch or button ends; make sure that while adjusting the stick length you observe the wires that pass through the stick shaft and through the gimbal opening in order to prevent damaging the connecting cables. The safest method is to remove the small set-screw from the side of the stick housing to allow the switch or knob internals to remain stationary while you rotate the stick housing for height adjustment. (4.3.7)***

4.3.2 Control Stick Angle Adjustment

It isn't possible to adjust the angle of rotation of control stick in the DS-12 transmitter.

4.3.3 Control Stick Tension Adjustment

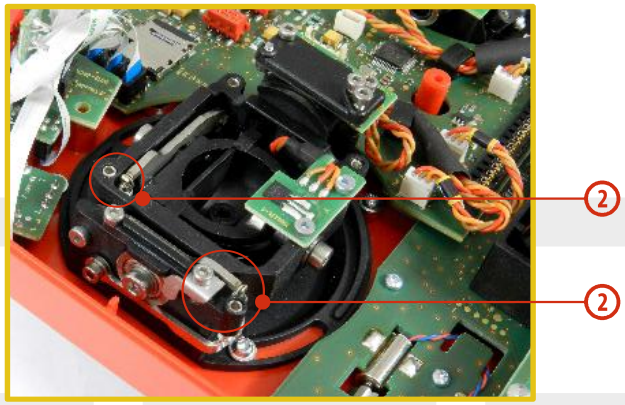
The stick gimbal tension is fully adjustable for each axis. This allows you to fully customize your radio's control feel. Simply adjust each gimbal's spring to your desired tension.

1. Switch off the transmitter and remove the 7 screws that secure the radio back cover. Next, remove the radio back cover.

Be sure to disconnect the transmitter battery pack connector.

2. Use indicated machine adjustment screws to change the **desired spring** tension. By turning the screw **countercloc kwise, you will loosen** spring tension. As a result the moving resistance of the control stick will **decrease.**

By turning the screw **clockwise, you will tighten** spring tension. As a result the moving resistance of the control stick will **increase.**



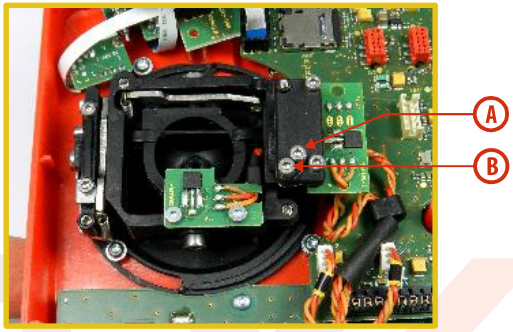
3. Reconnect transmitter battery pack and reinstall radio back cover and cover screws.

4.3.4 Ratchet Tension Adjustment

Whether you prefer smooth throttle feel or ratchet throttle feel, you can adjust the DS-12 transmitter either way you like allowing you to fully customize your radio's feel. Each tension is set by a different machine screw.

1. Switch off the transmitter and remove the 7 screws that secure the radio back cover. Next, remove the radio back cover. **Be sure to disconnect the transmitter battery pack connector.**

2. **For ratchet tension adjustment use the machine screw "A". Turn slowly (counter-clockwise)** until you achieve the desired ratchet tension. For smooth tension adjustment, use the machine screw "B". **Turn slowly (clockwise)** until you achieve the desired smooth tension.



3. Reconnect transmitter battery pack and reinstall radio back cover and cover screws.

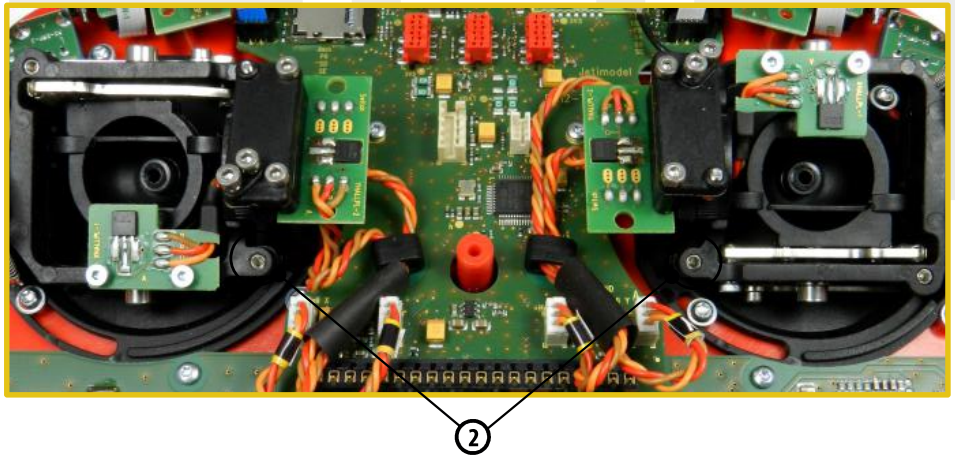
4.3.5 Throttle stick travel adjustment

The throttle stick travel is adjustable to suit your flying style.

1. Switch off the transmitter and remove the 8 screws that secure the radio back cover. Next, remove the radio back cover. Be sure to disconnect the transmitter battery pack connector.

2. Use indicated machine adjustment screws to limit the throttle stick travel. By turning the screw clockwise, you will shorten the throttle stick travel.

3. Reconnect transmitter battery pack and reinstall radio back cover and cover screws.



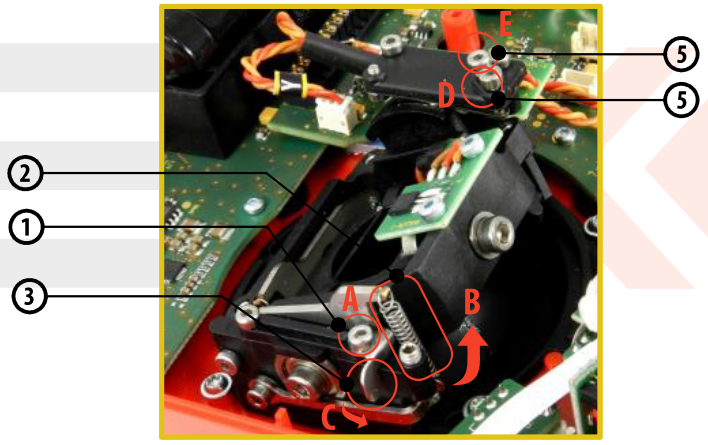
After making a limit change to the throttle stick travel you must recalibrate the transmitter stick in the software menu, ***see section 9.6.3 –Calibration of Proportional Controls.***

4.3.6 Changing the transmitter mode

The transmitter is equiped with universal multimode gimbals. Both gimbals are identical and can be adjusted mechanically for modes 1-5. After mechanical adjustment it is necessary to set a specific transmitter mode in the menu System – Configuration – Stick mode 1-4.

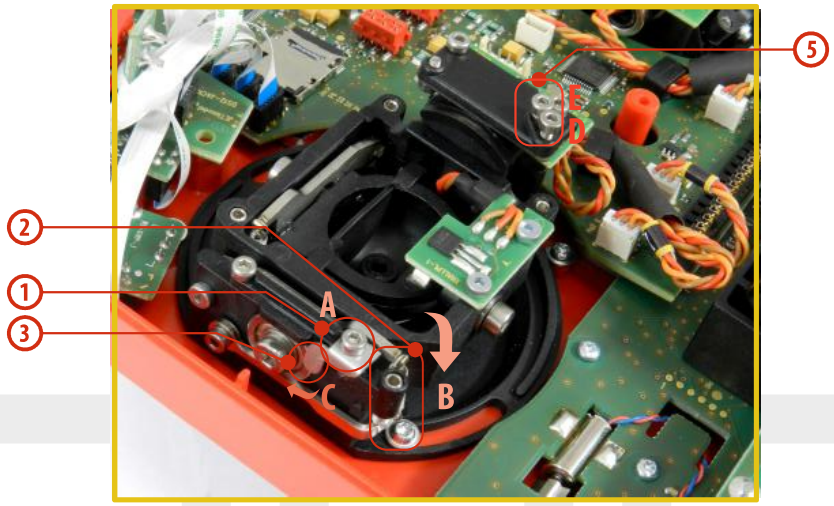
To change the quad sticks settings, unscrew the back cover of the transmitter and disconnect the battery connector.

A. Setting the multi-mode gimbal into the mode without locking the middle position - gas



1. Loosen the screw **A.**
2. Lift the lever B so as it is possible to arrest the lock **C.**
3. Turn the lock **C** 90° in the direction of the arrow and arrest the lever **B** in the upper position.
4. Tighten the screw **A.**
5. Tightening the the screws **D** and **E** sets the desired tension with steps and smooth brake.

B. Setting the multi-mode gimbal into the mode with locking the middle position - elevator



1. Loosen the screw **A.**
2. Slightly lift the lever **B.**
3. Turn the lock **C** in the direction of the arrow and arrest the lever **B** in the upper position.
4. Move the lever **C** in the direction of the arrow to release the lever **B.**
5. Tighten the screw **A.**
6. Loosen the screws E and D in a position so that tension is removed from the stick.

4.4 Swappable and Assignable Switches

One of the most important features of a JETI transmitter is the switch function assignment flexibility. The exact type of switch can be set in ***„menu->advanced->properties->sticks-switches->setup"***. There are many switches available to suit different needs. See your Jeti retailer for switch availability.

You may either swap the existing switches around or take advantage of the optional accessories and create your own custom configuration.

Factory Switch Configuration for the DS-12 Transmitter

Sa *- 3 - position short switch*

Sb *- 2 - position long switch*

Sc *- 2 - position long switch*

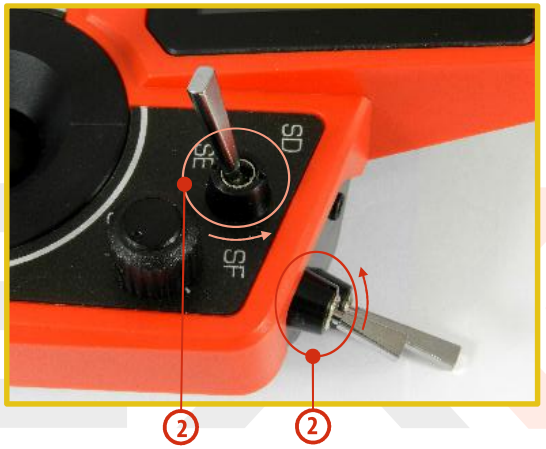
Sd *- 2 - position long switch*

Se *- 3 - position long switch*

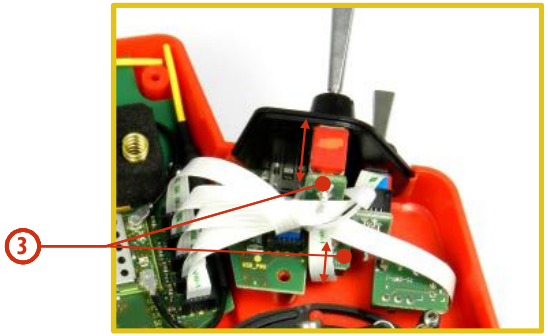
Sf *- 2 - position short switch*

4.4.1 Switch Removal Procedure

1. Switch off the transmitter and remove the 7 screws that secure the radio back cover. Next, remove the radio back cover.
   Be sure to disconnect the transmitter battery pack connector.
2. With the specialized wrench (not included) carefully loosen and remove the switch installation nut.



3. Hold the switch from the back side of the transmitter and pull it towards you, so that the switch is released from the body of transmitter.

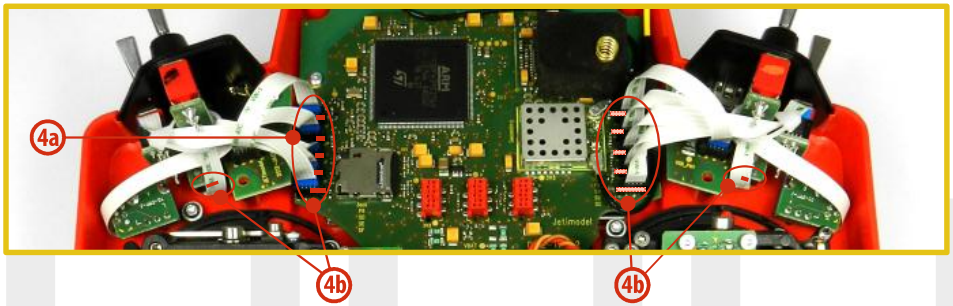


4. Disconnect the flat flexible cable from its connector on the main board.

   The flat flexible cables that link the main printed circuit board with the switches are oriented as shown in the picture **(4a)**.

   The wire is always color coded on one side of both ends **(4b)**.

   The markings must be oriented as shown below.



4.4.2 Assembly Procedure

1. Insert the flat flexible cable to the switch connector of the switch. See the orientation above.
2. Push the switch into its spot in the transmitter housing.
3. Tighten the switch installation nut from the front of the transmitter. Use the specialized wrench (not included).
4. Connect the flat flexible cable to the main printed circuit board of the transmitter. See the orientation above. The cable has to be inserted to the connector that matches the position on the front panel where the switch is installed.
5. Reconnect transmitter battery pack and reinstall radio back cover and cover screws.

After you turn on the transmitter for the first time after any switches have been modified, you will notice that the configuration for a selected model no longer matches.

Note: ***When replacing the switch Sb it is also necessary to remove the switches Sa and Sc from the transmitter body.***

When replacing the switch Se it is also necessary to remove the switches Sd and Sf from the transmitter body.

4.5 Digital Trims

Transmitter gimbals are used for controlling the basic flight functions like throttle, roll(aileron), pitch(elevator), and yaw(rudder). Immediately under the transmitter gimbal sticks you can see four push-buttons which are the programmable, digital trim buttons.

The digital trims are used for fine trimming of the flying model. When the transmitter is turned off, the trim values are stored in memory and are recalled when the system is turned back on.

Every model has its own trim setup. Also all flight modes may be configured to use different trim configurations. By pressing one of the buttons, the screen will automatically change to display the graphic position of that trim. The transmitter trims feature an acoustic step and center beep alarm.

4.6 Transmitter Battery Pack

The DS-12 transmitter is powered by a Li-Ion type battery pack and comes equipped with its own built-in advanced battery management and charging circuit. In switched-on position, the transmitter LCD display shows the status and condition of the battery pack. The Li-Ion battery is factory installed.

4.6.1 Charging

The DS-12 transmitter can be charged with the included wall power supply, optional car charger, or through the built-in USB port. For fast charging use the included wall power supply. Charging time is around 3 hours. During the charging process the transmitter can be in switched-on or off position. The charging status is clearly shown by lit green LED. If the transmitter is switched on during the charging process you can see the charging progress directly on the LCD display.

Transmitter Charging:

1. Plug-in the included power supply to a wall outlet.
2. Plug the main charging connector into the transmitter. If the green LED goes out, the transmitter is not fully charged. The red LED indicates the battery charging status.

   • Discharged battery – red LED is slow blinking, the green LED is OFF

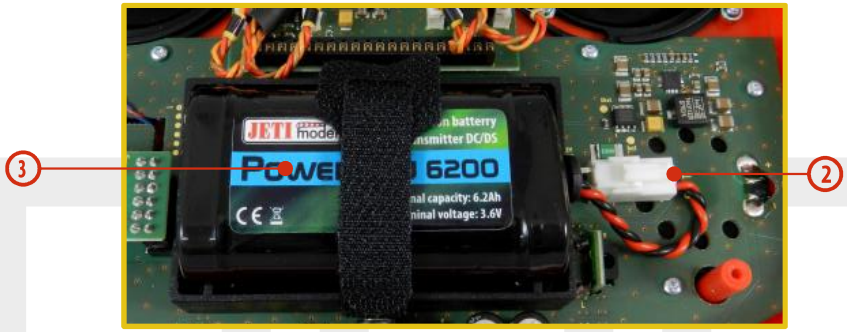
   • Close to full charge – red LED is permanently ON, the green LED is OFF

   • Fully charged battery – the green LEDs are ON

4.6.2 Battery Replacement

Should you decide to replace the transmitter battery, please follow these steps:

1. Switch off the transmitter and remove the 7 screws that secure the radio back cover. Next, remove the radio back cover.
2. Disconnect the transmitter battery connector.
3. Loosen the battery fastening strap and remove the battery.

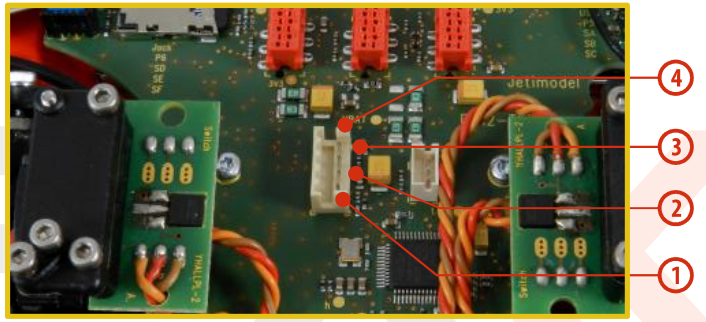


***Note:** If the transmitter battery has been disconnected for longer than 1 minute, the time and date will be deleted.*

***Warning:** DS-12 transmitters should only be operated only with original or manufacturer approved battery packs. The use of other battery packs will void the warranty.*

4.7 PPM Input/Output Connector

The **PPM** output is accessible via connector labeled "**B**". This connector features the non-stabilized battery voltage output in the range of 3.2V - 4.2V (max. 1A) which can be used as power supply for the connected HF module as well as for the PPM signal output. The transmitter output functions are in the form of a standard PPM signal.



1. PPM input (3V logics)
2. Positive (+) pin
3. Negative (-) pin
4. PPM signal output (3V logics, configurable in **„System->Configuration")**

4.8 Handling

The DS-12 is equipped with a handle for practical manipulation as shown in the picture.

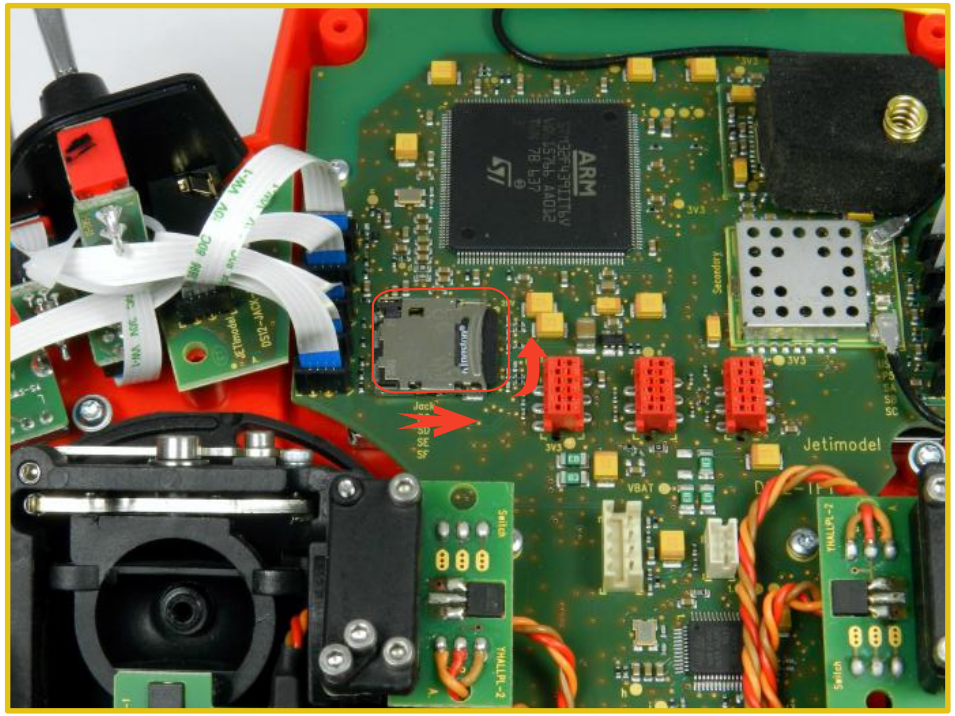
The transmitter 2.4GHz antenna locations are shown in the picture below.

Warning: ***Before each flying session, and especially with a new model, it's important to perform a range check. If you are operating a model with a DS-12 transmitter do not shield and avoid contact of the transmitter antennas (see Photo)with your body.***

4.9 Change SD Card

Disconnect the battery plug .

To open the SD card holder, use a fingernail to push the metal frame to the right and then lift it carefully . The micro SD card can now be removed . For installation, proceed in the reverse order .



5 RF Transmitter Modules

In order to achieve the highest transmission quality and reliability of the DS-12 transmitters, we have decided to equip the radio with two independent transmitter modules (DUPLEX 2.4GHz and 900MHz NG). The transmitter modules have separate antennas. From the point of transmission they are fully independent from each other. The RF modules of the transmitter can operate in following modes:

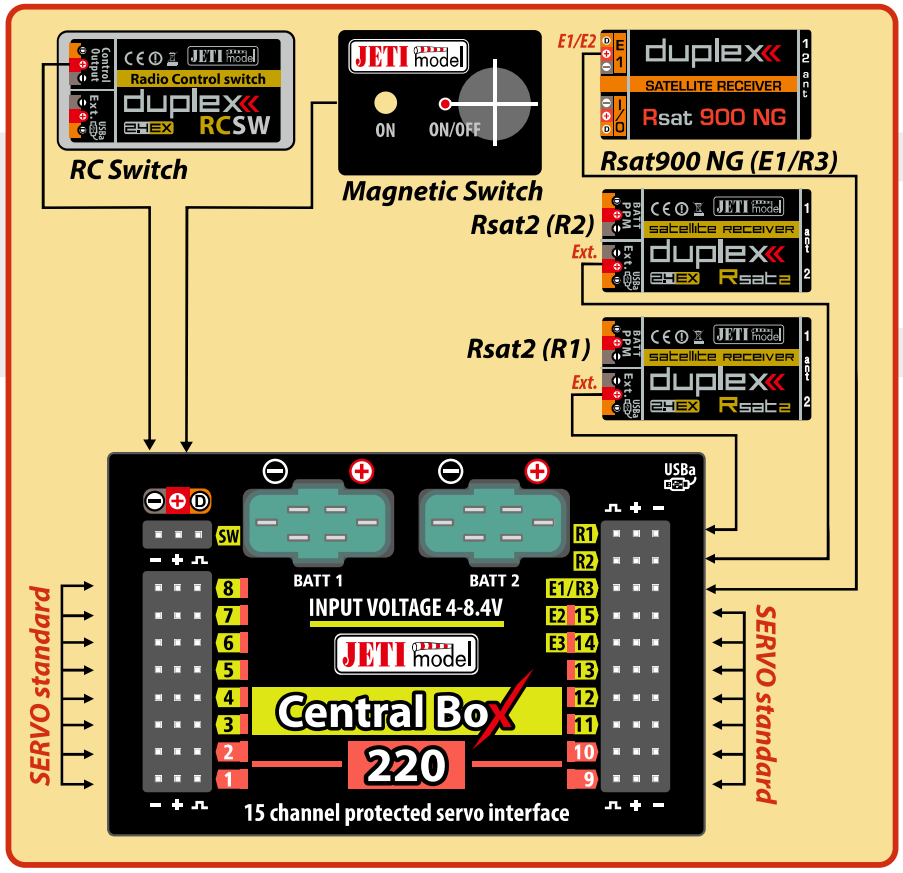
- ***"Default"mode*** – the 2.4GHz Duplex module communicates with the receiver using its two independent antennas. This improves safety and helps to cover dead angles as well.
- ***"Double Path"mode*** – the transmitter RF module communicate independently with two different receivers. The receivers can be interconnected via an intelligent synthesizer, for instance the JETI Enlink, or the basic control functions can be divided between two independent receivers. In this mode the 2.4GHz Duplex module communicates independently with two receivers. This greatly improves safety and reliability since both receivers communicate independently with the RF module.
- **„Student"mode** – the 2.4GHz Duplex module is assigned to communicate with the instructor transmitter only. Communication with the model takes place via instructor's transmitter only. If you operate two of the DS-12 transmitters, one of them in the "Instructor" mode and the other one in the "Student" mode, the transmitters communicate between each other via cable connection.

- **Back-up Transmitter Module**

The DS-12 are equipped with a wireless backup system . This works on the 868MHz (EU) or 915MHz (US, AU, JP) band . This backup system can optionally be used to the "standard" and "2-way RF" modes. So it is not designed as a single transmission path and provides additional redundancy in addition to the 2.4GHz system .

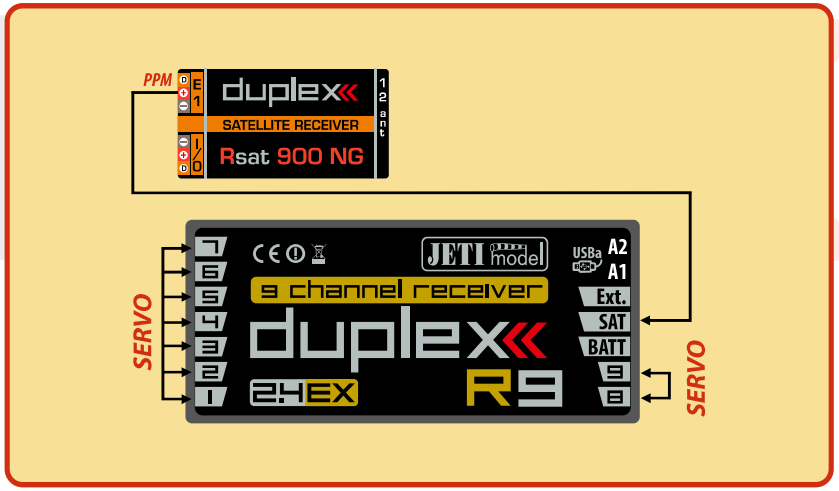
Recommended connection for Rsat900 NG as a backup receiver with a Central Box

- Always connect the RSat2 or R3/RSW as the primary receiver in the "RX1" slot of the Central Box.
- The RSat900 NG is connected to the " Rx2 " slot of the Central Box
- Both receivers are set to EX Bus output.



Connecting the RSat 900 NG directly to a Primary receiver:

- The RSat900 receiver is plugged into the "Sat1" slot of the primary receiver.
- The RSat900 NG receiver is set to PPM output and the primary receivers "Sat1" slot is set to PPM input.



6 Transmitter Powering ON/OFF

6.1 Transmitter Powering-ON

Switching-on is achieved by pressing and holding the **"Power"** button **(1)**. The green LED turns ON and the initial screen appears on the LCD display. At this point transmitter is waiting for final confirmation – press the **F5 (Yes)** button **(2)**. After confirmation, the main screen is displayed and the transmitter is ready. The power-on status of the DS-12 transmitter is indicated by the lit green LED.

* If you do not confirm powering-on witinin a certain time limit, the transmitter will turn off automatically. In the DS-12 transmitter setup you may disable the confirmation by changing in the setup menu ***"Main menu->System-> Configuration->Fast switch-on".***

Advice: ***We recommend that you leave the transmitter with the switch-on confirmation enabled, as this function prevents accidental turning-on and discharging of the transmitter battery.***

6.2 Transmitter Turning-OFF

The transmitter is switched-off by pressing the "**Power**" main button. Before complete power-down is achieved you will be asked for additional confirmation. In case of an emergency, a fast turn-off can be achieved by simultaneously pressing and holding the "**Power**" and "**esc**" buttons. **NEVER** use this alternative during normal working conditions.

Advice: ***If you want to find out the battery status on a switched-off transmitter just push the button "Power" and the initial screen with the battery status will appear. If you do not confirm turning-on, the transmitter will shut down automatically. During the charging process this function is always activated.***

6.3 Transmitter Restart

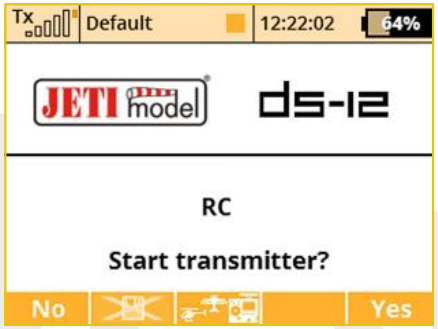
In case of erratic behavior we recommend that you restart the DS-12 to reboot the operation system.

1. Standard switch-OFF and ON with main„Power" button.
2. If necessary, use the Emergency Switch-OFF by simultaneously pressing and holding the„Power" and„esc" buttons.
3. Disconnect and reconnect the transmitter battery connector.

[***a)*** *Remove the screws that secure the radio back cover. Next, remove the radio back cover,* ***b)*** *Disconnect the transmitter battery connector,* ***c)*** *Press the "Power" button to discharge the internal capacitors,* ***d)*** *Reconnect the transmitter battery,* ***e)*** *Reconnect transmitter battery pack and reinstall radio back cover and cover screws,* ***f)*** *Restart the system.]*

7 Initial switching-on

Turn the transmitter on by pressing and holding the „**Power**“ button for a couple of seconds and then press the "**F5 (Yes)**" button to confirm, see chapter 6.1. The display shows the Main screen and displays the currently loaded model aircraft.



You can also immediately select a different model after the transmitter starts by pressing the "**F3**" button.

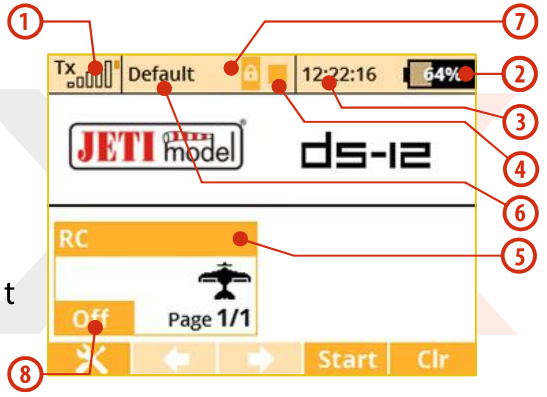
By pressing the "**F2**" button you are able to disable the logging feature for a current session. If you are just making adjustments to the model configuration, press the "**F2**" button and confirm. The logging will be disabled until restart of the transmitter.

To make the start-up screen visible, in the Configuration Menu, you have to select "**No**" for the "**Disable startup question**" option.

7.1 Main display

The main screen displays basic information about operation of your transmitter, such as the battery level, time, flight mode, etc. This screen will also display the user defined information you want to monitor, for example: **stopwatch, telemetry values, etc.** The main screen consists of three main sections: **the status bar, the desktop and the lower bar.**

The status bar at the top of the main display displays the following information:



1. Signal strength
2. Battery status
3. Time
4. Telemetry recording icon
5. Model Name
6. Name of actual flight mode
7. Throttle Lock
8. Motor cut-off indication, idle

The Desktop is the largest part of the screen. This is where you can see your telemetry data and where any programmed alarms are displayed. The Desktop displays your user-defined information through the use of multiple pages. As you add or remove telemetry items or alarms, the number of available pages will automatically increase or decrease as needed.