duplex«

DC/DS-16 II
2.4GHz & 900MHz NG
Dual Band System

FW 5.00　　　　　**Part I. - User Manual**　　　　　**EN**

① Introduction

1.1 DC/DS

The DC/DS transmitters were 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 metal case, with its chemically resistant finish, provides maximum protection for the interior components. The straightforward case shape makes servicing easy. The all-metal, ball bearing equipped, control gimbals with their magnetic Hall sensors are another revolutionary design concept used to make the DC/DS 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.

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 **(DC-16 II)**, 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 DC-16 II to your computer and enable USB mode.
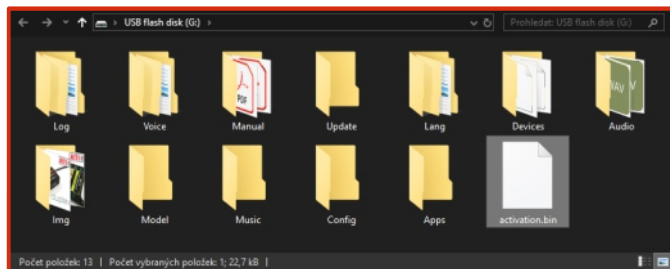
7. Copy the *"Activation.bin"* file to the transmitter SD card into the root folder. The contents of the transmitter SD card can then look like this:

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 DC/DS 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 DC/DS-16 II transmitters feature a backup wireless system for unmatched data transmission safety and reliability.

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

Transmitters - the DC/DS 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.

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 DC/DS may also be charged through the USB to PC interface. The charging progress is shown on the DC/DS display.

Integrated Antenna – the antennas are located behind fully integrated covers in both the DC/DS cases 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 DC/DS menu.

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

Swappable and Assignable Switches – all of the switches on the DC/DS 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 DC/DS 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 DC/DS 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 DC/DS 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 DC/DS 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 DC-16 II Package Contents

1. JETI DC-16 II Transmitter, **2.** Wall Power Supply, **3.** JETI DC Transmitter Aluminum Case, **4.** USB PC Cable, **5.** Installation Key Set (HEX 1,5; TORX 10), **6.** Cleaning Cloth, Instruction Manuals,

1.7 DS-16II Package Contents

1. JETI DS-16II Transmitter, **2.** Wall Power Supply, **3.** JETI DS Transmitter Aluminum Case, **4.** USB PC Cable, **5.** Installation Key Set (HEX 1,5; TORX 8; TORX10), **6.** Cleaning Cloth, Instruction Manuals,

2 System Specifications

Parameter	DC-16 II.	DS-16 II.
Channels	24	24
Control Inputs (Stick/Switch/Knob)	18	16
Backup Module 900MHz NG (next generation) 863 - 870 MHz (EU), 902 - 928 MHz (US)	(upgradable) *	(upgradable) *
Flight Modes	10	10
Free Mixes	20 (up to 25)	20 (up to 25)
Data Graphs	Active	Active
Audio Player	Active	Active
Logical Switches	16 (up to 24)	16 (up to 24)
Number of Remote Commands	16 (up to 24)	16 (up to 24)
Servo Sequencer	6 (up to 10)	6 (up to 10)
Timers	10	10
Displayed Telemetry Values	40	40
Sound on Events	20 (up to 30)	20 (up to 30)
Alarms	40	40
Vibration Alarms	-	-
Voice Output	Active	Active
MP3	Active	Active
Microphone	Active	Active
Gyro Settings	3	3
Servo Balancer	Active	Active
Function Curves	Active	Active
Throttle Limiter (heli)	Active	Active

| Parameter	DC-16 II.	DS-16 II.
Variometer	Active	Active
Flight Mode Trim	Active	Active
Data Stream Logging	80	80
Telemetry Controls	8	8
Voice Commands	0 (up to 15)	0 (up to 15)
Lua Apps	10	10
Ditex Servo Telemetry	16	16
Double Path	Active	Active
Accelerometer	-	Active
RF modules 2.4GHz/900MHz	2/1	2/1
Number of antenas 2.4GHz/900MHz	4/1	4/1
Gimbals & Buttons	Aluminum	Aluminum
Transmitter Frame	Aluminum	Aluminum
Stick Resolution	4096	4096
Gimbal Hall Sensors/Vibration	Yes/-	Yes/-
Memory, SD Card	8 GB	8 GB
Backlit LCD	3.5" 320x240px color high contrast	3.5" 320x240px color high contrast
Weight (g)	1500g	1200g
Transmitter Battery Pack (mAh)	Li-Ion 6200	Li-Ion 6200
Transmitter Aluminum Case	Included	Included

3 Description of Transmitter DC-16 II

3.1. Control Identification

1. Right Stick 1, 2 – the DC-16 II Transmitter Supports Modes 1-4, see Control Sticks -> mode change
2. Left Stick 3, 4 the DC-16 II Transmitter Supports Modes 1-4, see Control Sticks -> mode change
3. Swappable and Assignable Switches: Sa, Sb, Sc, Sd, Se, Sf, Sg, Sh, Si, Sj
4. Digital Trims for the Left Stick T3, T4
5. Digital Trims for the Right Stick T1, T2
6. Right Side Control Lever 5
7. Left Side Control Lever 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. Antenna/Transmitter Handle
17. Charge Jack
18. USB PC Interface
19. Earphone Jack
20. ON/OFF & Charging LED Indicators
21. Speaker
22. Harness Bracket (optional accessory) Installation Holes
23. Microphone

3.2. Assembly Identification

24. Transmitter Battery Pack

25. Memory Card Micro SD 8GB

26. PPM Output Connector

27. Left Gimbal Assembly

28. Right Gimbal Assembly

29. 2.4 GHz Module

30. 900MHz Module NG (Next Generation)

31. PPM Input/Output

32. Battery Connector

**DC-16 II**
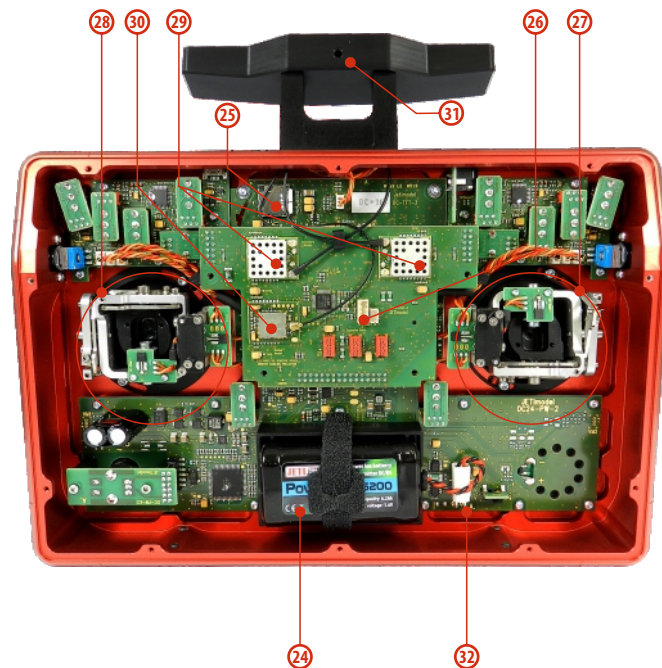
3.3   Control Stick Assembly

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!

3.3.1 Control Stick Length Adjustment

The stick length is adjustable to suit your flying style. The stick end separates into two parts.
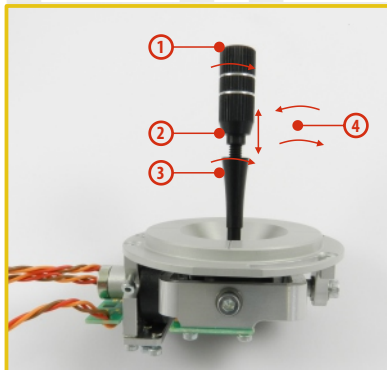
1. Hold the top part of the stick end firmly and unscrew by turning counter-clockwise.

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 rotatethe stick housing for height adjustment.. (See 4.3.6)
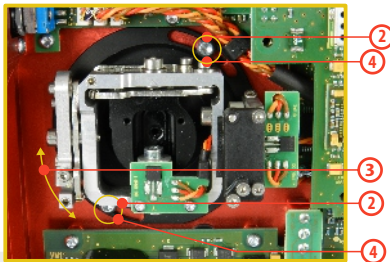
3.3.2 Swivel Control Stick Adjustment

In order to customize the feel of your radio you may adjust the angle of the stick control assemblies.

1. switch off the transmitter and remove the 10 screws that secure the radio back cover. Next, remove the radio back cover. **Be sure to disconnect the transmitter battery pack connector.**
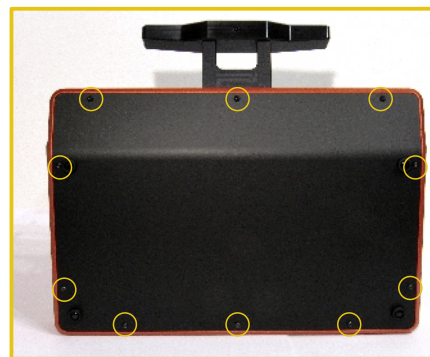
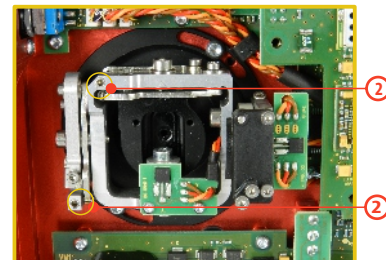**2.** Loosen both machine screws securing the control stick assembly.

3. Adjust (rotate) to desired position.

4. Securely tighten both machine screws securing the control stick assembly.

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

3.3.3 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 10 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 **counterclockwise**, 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.

3.3.4 Ratchet Tension Adjustment

Whether you prefer smooth throttle feel or ratchet throttle feel, you can adjust the DC-16 II 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 10 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 achine 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.

3.3.5 Throttle stick travel adjustment

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

1. Switch off the transmitter and remove the 10 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.
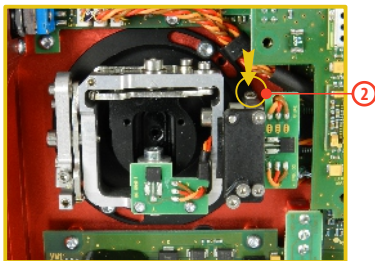
After making a limit the throttle stick travel you must re-

calibrate the transmitter stick in the software menu, *see section Calibration of Proportional Controls*.

3.3.6 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 quad stick into the mode without locking the middle position - gas
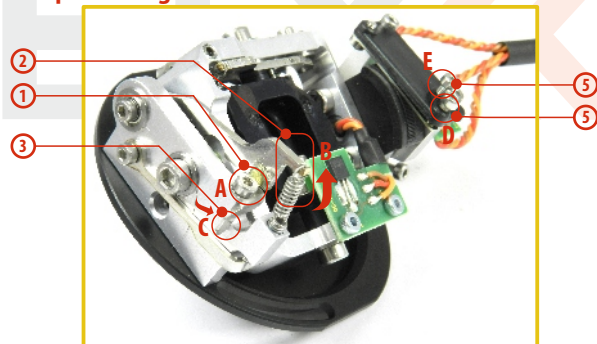
1. Loosen the screw **A.**
2. Lift the lever B so as it is possible to arrest the lock **C.**
3. Turn the lock **C** 90° in the direction of the arrow and arrest the lever **B** in the upper position.

4. Tighten the screw **A.**

5. Tightening the the the screws **D** and **E** sets the desired arresting with steps and smooth brake.
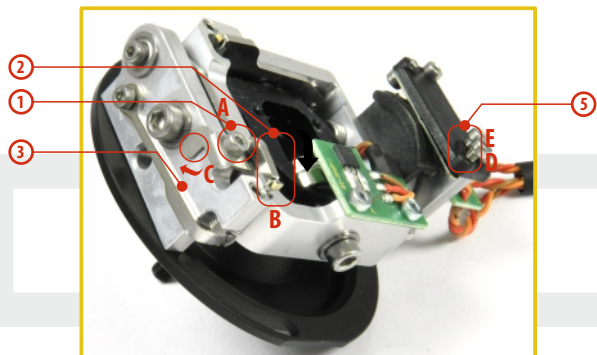
B. Setting the multi-mode gimbal into the mode with locking the middle position - elevator

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 the tension is removed from the stick.

3.3.7 Transmitter Gimbals with Switch or Button Installation

If you want to operate the DC-16 II transmitter using the optional stick end switch or button functions, you must purchase one or more of these separately:
• Stick with 2-position switch
• Stick with 3-position switch
• Stick with push-button
• Stick with potenciometer

Advice: *For installation of the optional gimbal stick ends with switches/buttons we recommend that you send your transmitter to one of the factory authorized service centers or to your authorized dealer.*

1. Switch off the transmitter and remove the 10 screws that secure the radio back cover. Next, remove the radio back cover.
Be sure to disconnect the transmitter battery pack connector.
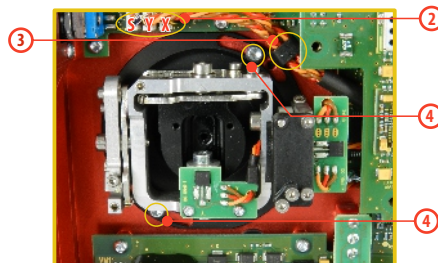
2. Disconnect the control stick assembly wires from the Tx board. (3 wires **X, Y, S**)

3. Remove the stick assembly connecting wires from their holders.

4. Remove both machine installation screws for each of the control stick assemblies.

5. Carefully remove both control stick assemblies. Gently pull in your direction (toward the transmitter back side). This upgrade will be done outside of the transmitter case.
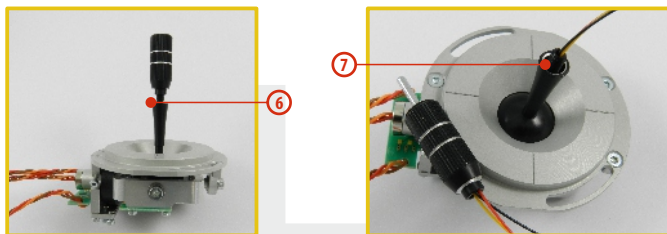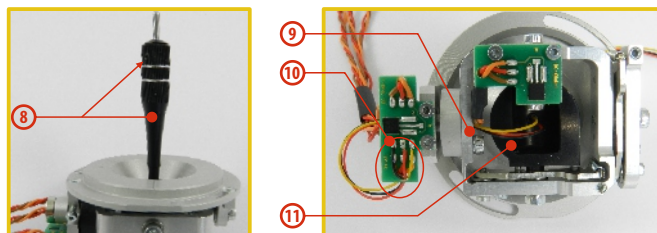

6. Unscrew the upper part of the stick assembly (anticlockwise).

7. Insert the connecting wires through the hollow opening of the transmitter stick.

8. Adjust length of the stick to suit your flying style.

Note: After installation of the optional stick ends with switch or button 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.

9. Pass the switch wires through the same gimbal opening as the hall sensor cable (through the center of the gimbal assembly).

10. Next insert wire ends through the opening of the printed circuit board and solder them to the matching soldering points in such a way that the same color wires lay on the top of each other.

11. Carefully move transmitter sticks to their full outside positions in order to make sure that you have sufficient wire length and, if needed, adjust accordingly. The connecting cables for all moving parts of the unit should have sufficient length in order not to be exposed to any mechanical damage and any bending stresses.
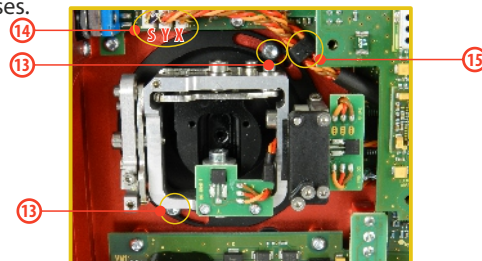
12. Install stick unit assembly back to correct position.

13. Install and secure the machine screws for the control stick assembly.

14. Connect control stick assembly wires to the Tx board connector (3 wires **X, Y, S**). Pay close attention to the wire lengths. Connect the longest wire as the first one from the outside of the transmitter (3 connectors **X, Y, S**).

15. Secure the stick assembly wires into their holders.

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

After the switch has been installed into the stick assembly you have to re-configure and enable it in the transmitter software before it will function properly. This can be done in the transmitter menu *"Main menu->Advanced setup->Sticks/ switches setup", (see Installation and Configuration of Gimbals Switches 9.3.2)*

3.4 Swappable and Assignable Switches

One of the most important features of a JETI transmitter is the switch function assignment flexibility. The DC-16 II transmitter automatically detects the type of switch and assigns the selected function. 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 Configurations for the DC-16 II Transmitter

Sa - 2- position spring-loaded long switch

Sb - 3- position short switch

Sc - 2- position short switch

Sd - 2- position long switch

Se - 3- position short switch

Sf - 3- position short switch

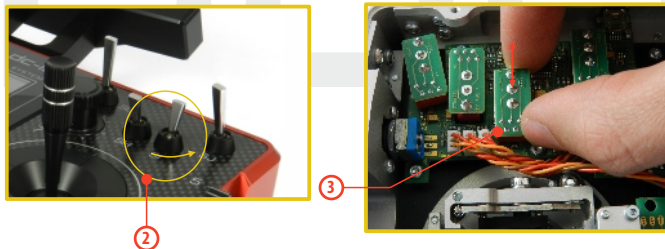*Sg* - 3- position long switch

Sh - 2- position short switch

Si - 2- position short switch

Sj - 3- position long switch

Switch Exchange:

1. Switch off the transmitter and remove the 10 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. Carefully hold the switch by its printed circuit board assembly and slowly pull it out. Use this method to also remove and exchange all of the other switches. After re-assembling and turning on your transmitter the software will sound a warning reminding you that you have executed a change. Always reinspect all assigned functions of the switches before attempting to fly.

3.5 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 centre beep alarm.

In the "Digital trim" menu it's possible to enable a special function used as automatic trimming. Digital trim steps and trim range setting is explained in *"Main menu->Fine tuning/flight modes->Digital trim"*

3.6 Transmitter Battery Pack

The DC-16 II 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.

3.6.1 Charging

The DC-16 II 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 red and green LEDs. 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 red and green LEDs are ON

3.6.2 Battery Replacement

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

1. Switch off the transmitter and remove the 10 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: DC-16 II transmitters should only be operated only with original or manufacturer approved battery packs. The use of other battery packs will void the warranty.

3.7 PPM Input/Output Connector

The **PPM** output is accessible via internal connector labeled "**B**". This connector features a non-stabilized battery voltage output in the range of 3.2V - 4.2V (max. 1A) which can be used as a 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.
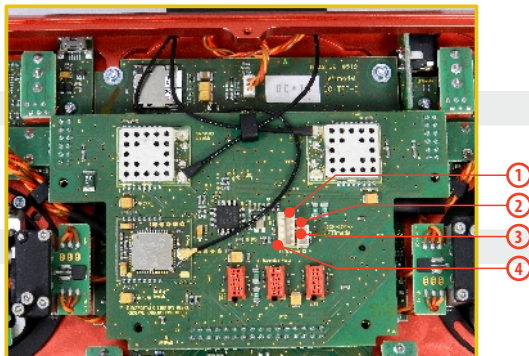
1. PPM input (3V logics)
2. Positive (+) pin
3. Negative (-) pin
4. PPM signal output (3V logics, configurable in *„System ->Configuration"*)

3.8 Handling

The DC-16 II transmitter can be comfortably carried by the antenna cover/handle as shown in the image 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 DC-16 II transmitter do not shield and avoid contact of the transmitter antenna with your body. This might increase likelihood of range problem.**

3.9   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 .

4 Description of Transmitter DS

4.1 Control Identification DS-16II

1. Right Stick 1, 2 – the DS-16 Transmitter Supports Modes 1-4, see Control Sticks -> mode change
2. Left Stick 3, 4 the DS-24 Transmitter Supports Modes 1-4, see Control Sticks -> mode change
3. Swappable and Assignable Switches: Sa, Sb, Sc, Sd, Se, Sf, Sg, Sh
4. Digital Trims for the Left Stick T3, T4
5. Digital Trims for the Right Stick T1, T2
6. Right Side Control Lever 5
7. Left Side Control Lever 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. Transmitter Neck Strap Bracket Installation Holes
23. Neckstrap Hook
24. Earphone Jack
25. 900 MHz Antenna
26. Microphone

4.2 Assembly Identification

27. Battery Connector
28. Transmitter Battery Pack
29. PPM Output Connector
30. Left Gimbal Assembly
31. Right Gimbal Assembly
32. SD Card
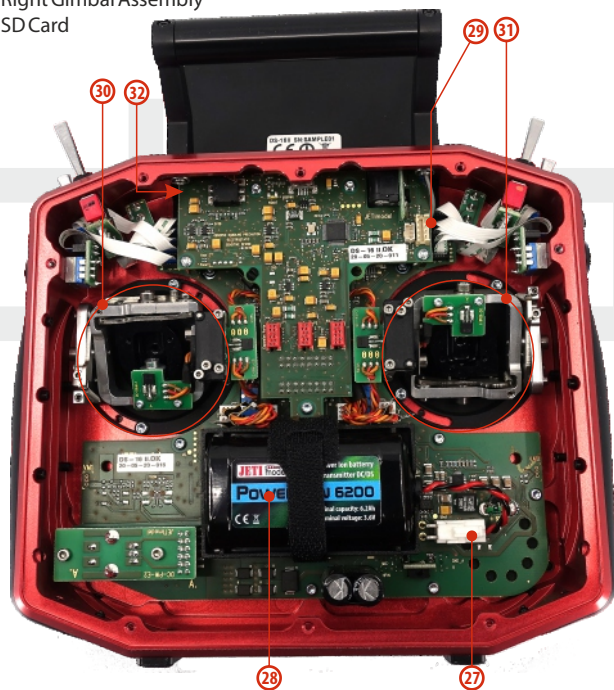
4.3 Control Stick Assembly

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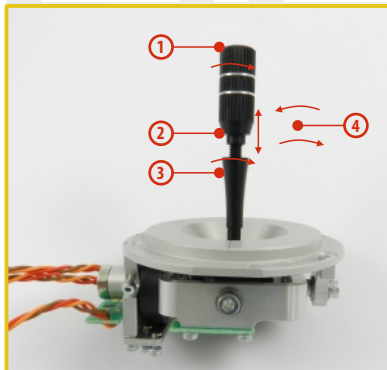
1. Hold the top part of the stick and firmly and unscrew (turn it anticlockwise).

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)
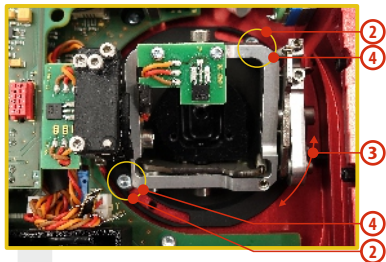
4.3.2 Control Stick Angle Adjustment

In order to customize the feel of your radio you may adjust the angle of the stick control assemblies.

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.**

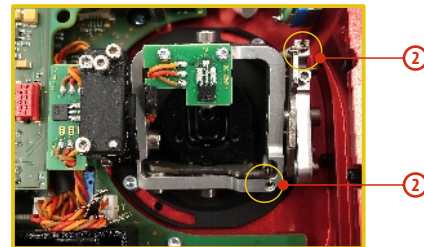**2.** Loosen both machine screws securing the control stick assembly.

3. Adjust (rotate) to desired position.

4. Securely tighten both machine screws securing the control stick assembly.

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

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 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 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.**
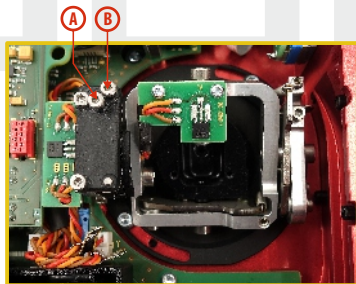

3. Reconnect transmitter battery pack and reinstall radio back cover and cover screws.

4.3.4 Ratchet Tension Adjustment

Whether you prefer smooth throttle feel or ratchet throttle feel, you can adjust the DS-16II 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 8 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.
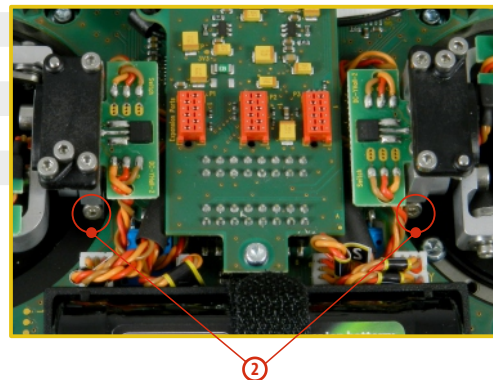
After making a limit change to the throttle stick travel you must recalibrate the transmitter stick in the software menu, *see section –Calibration of Proportional Controls.*

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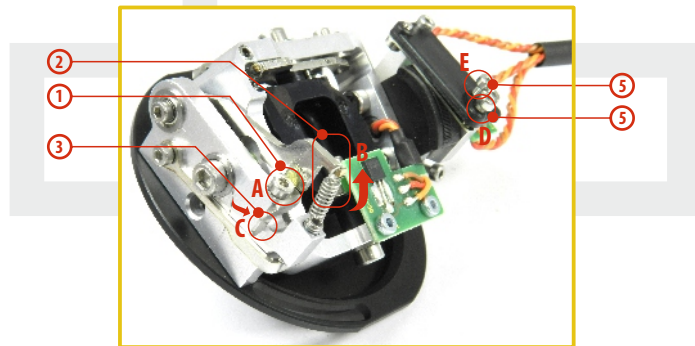
1. Loosen the screw **A.**
2. Lift the lever B so as it is possible to arrest the lock **C.**
3. Turn the lock **C** 90° in the direction of the arrow and arrest the lever **B** in the upper position.
4. Tighten the screw **A.**
5. Tightening the the screws **D** and **E** sets the desired tension with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

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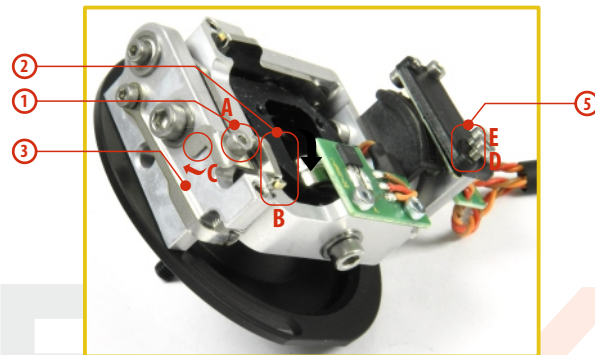
1. Loosen the screw **A.**
2. Slightly lift the lever **B.**
3. Turn the lock **C** in the direction of the arrow and arrest the lever **B** in the upper position.
4. Move the lever **C** in the direction of the arrow to release the lever **B.**
5. Tighten the screw **A.**
6. Loosen the screws E and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

### 4.3.7 Transmitter Gimbals with Switch or Button Installation

If you want to operate the DS-24 transmitter using the optional stick end switch or button functions, you must purchase one or more of these separately:
• Stick with 2-position switch
• Stick with 3-position switch
• Stick with push-button
• Stick with potenciometer

Advice: *For installation of the optional gimbal stick ends with switches/buttons we recommend that you send your transmitter to one of the factory authorized service centers or to your authorized dealer.*

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. Remove the screws of the upper printed circuit board (the "**T**" plate).

3. Remove the "**T**" circuit board by grasping the plate by its edges near where the bottom fastener goes. Gently lift the board to disconnect its connectors from the board below. Once disconnected, tilt the board upward toward the display so that it is out of the way.

4. Disconnect the control stick assembly wires from the Tx board. (4 wires **X, Y, S, M**).

5. Remove the stick assembly connecting wires from their holders on the main board.

30
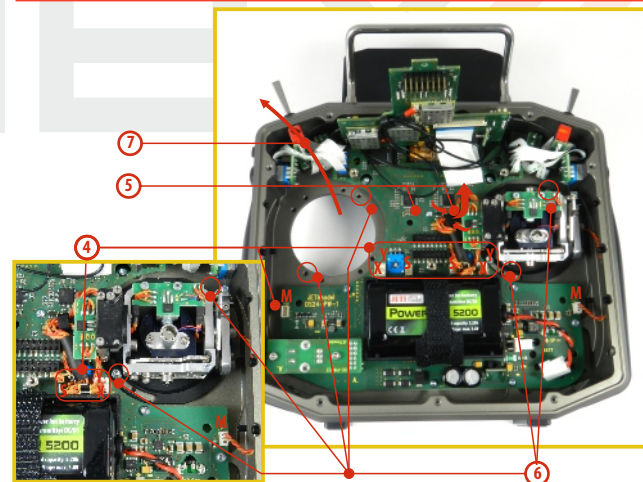
6. Remove both installation machine screws for each of the control stick assemblies.

7. Carefully remove both control stick assemblies. Gently lift in your direction (toward the transmitter back side).
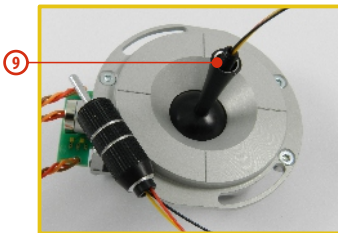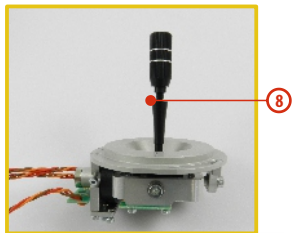
8. Unscrew the upper part of the stick assembly counter clockwise.

9. Insert the connecting wires through the hollow opening of the transmitter stick.
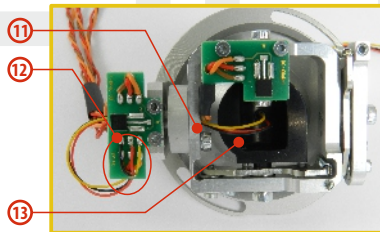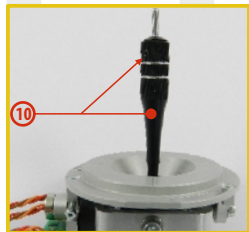
10. Adjust length of the stick to suit your flying style. (See 4.3)

Note: **After installation of the optional stick ends with switch or button, 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.

11. Pass the switch wires through the same gimbal opening as the hall sensor cable (through the center of the gimbal assembly).

12. Next insert wire ends through the opening of the printed circuit board and solder them to the matching soldering points in such a way that the same color wires lay on the top of each other.

13. Carefully move transmitter sticks to their full outside positions in order to make sure that you have sufficient wire length and, if needed, adjust accordingly. The connecting cables for all moving parts of the unit should have sufficient length in order not to be exposed to any mechanical damage and any bending stresses.

14. Install the stick unit assembly back into its correct position.

15. Install and secure the machine screws for the control stick assembly.
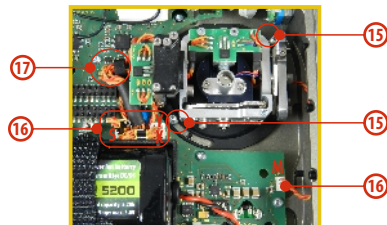
16. Connect the control stick assembly wires to the Tx board connector (4 wires **X, Y, S, M**). Pay close attention to the wire lengths. Connect the longest wire as the first one from the outside of the transmitter (4 connectors **X, Y, S,M**).

17. Secure the stick assembly wires into their holders.

18. Mount the "**T**" plate back into place. First insert the connectors of the "**T**" printed circuit board into the body of transmitter and then carefully insert the "**T**" plate into its connectors on the main board. Be careful while handling the wires underneath the "**T**" plate to avoid any resistance when installing the "**T**" plate. If the wires cause any resistance or if the wires are pinched or stressed in any way, please re-route the wires and try the "**T**" board installation again.

19. Reinstall the **"T"** plate mounting screws.

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

After the switch has been installed into the stick assembly you have to re-configure and enable it in the transmitter software before it will function properly. This can be done in the transmitter menu *"Main menu->Advanced setup->Sticks/ switches setup", (see Installation and Configuration of Gimbals Switches)*

Warning: **You should keep the wire placement as shown in the picture. The wires must be placed as far as possible from the magnetic element *a).* Please avoid permanent contact of the wire with the magnetic element. It could damage the insulation of the wires.**
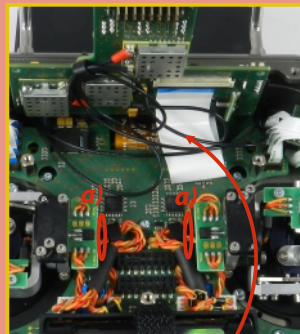
Proper arrangement of the display flat, flexible cable.
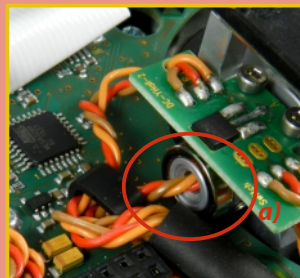
4.4 Swappable and Assignable Switches

One of the most important features of a JETI transmitter is the switch function assignment flexibility. The DS-24 transmitter automatically detects the type of switch and assigns the selected function. 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-24 Transmitter

Sa - 3 - position short switch

Sb - 2 - position long switch

Sc - 2 - position short switch

Sd - 2 - position long switch

Se - 3 - position long switch

Sf - 2 - position short switch

Sg - 2 - position spring-loaded long switch

Sh - 2 - position short switch

4.4.1 Switch Removal Procedure

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. 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 Sa it is also necessary to remove the switches Sb and Sc from the transmitter body.*
>
> *When replacing the switch Sc it is also necessary to remove the switch Sb from the transmitter body.*
>
> *When replacing the switch Sh it is also necessary to remove the switches Sg and Sf from the transmitter body.*
>
> *When replacing the switch Sf it is also necessary to remove the switch Sg 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-16II 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-16II 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 red and green LEDs. 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 red and 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 8 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.
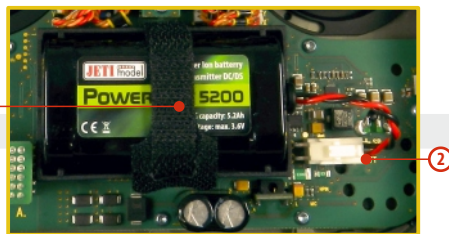
Note: *If the transmitter battery has been disconnected for longer than 1 minute, the time and date will be deleted.*

Warning: *DS-24 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.
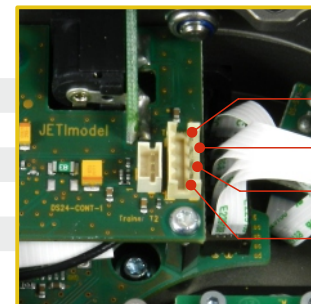
1. PPM input (3V logics)
2. Positive (+) pin
3. Negative (-) pin
4. PPM signal output (3V logics, configurable in „**System->Configuration**")

4.8   Handling

The DS-16II is equipped with a handle for practical manipulation as shown in the picture. Inside of this handle is a 900 MHz antenna.

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-24 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 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)**.
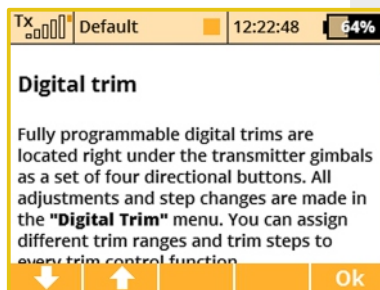
This help mode is available in FW min. v5.00. We recommend update your transmitter by Jeti Studio.

6 RF Transmitter Modules

In order to achieve the highest transmission quality and reliability of the DC/DS transmitters, we have decided to equip the radio with two independent DUPLEX 2.4GHz transmitter modules and a single 900MHz NG transmitter module. 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 primary and secundary transmitter RF modules are active. Both modules alternately communicate with the receiver. This improves safety and helps to cover dead angles as well.

- *"Double Path"mode* – the transmitter RF modules communicate independently from each other 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 one part of a model can be controlled with one receiver using the first transmitter RF module, theother part of a model with a second receiver and the second RF module. In an instant you have created a dual, redundant flying system with two receivers and two RF modules. This greatly improves safety and reliability since both RFmodules alternate their communication with both receivers.

- **"Trainer"mode** – one of the RF transmitter modules is assigned to communicate with the instructor/student transmitter only. Communication with the model takes place via instructor's transmitter only. If the DC/DS transmitter is in the "Instructor" mode, the primary RF module communicates with the model and the secondary RF module communicates with the student's transmitter. In the "Student" mode the DC/DS transmitter communicates via the primary RF module with the instructor's transmitter. If you operate two of the DC/DS transmitters, one of them in the "Instructor" mode and the other one in the "Student" mode, the transmitters communicate between each other via dedicated RF transmitter module. With this advanced system NO additional equipment is necessary.

- **Back-up Transmitter Module**
The DC-16 II are equipped with a wireless backup system . This works on the 868MHz (EU) or 915MHz (US) 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 Rsat 900 NG as a backup receiver with a Central Box

- Always connect the RSat2 or R3/RSW as the primary receiver in the "R1/R2" slot of the Central Box.

- The RSat 900 NG is connected to the " R3 " slot of the Central Box

- Both receivers are set to EX Bus output.
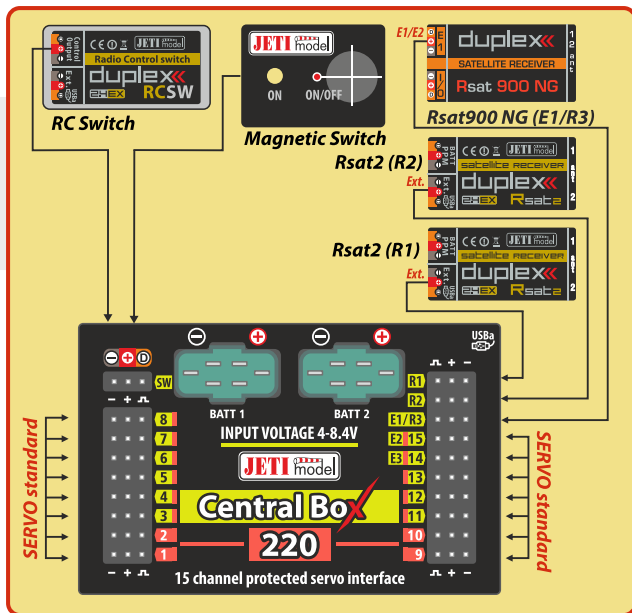
Connecting the RSat 900 NG directly to a Primary receiver :

- The RSat 900 NG receiver is plugged into the "Sat1" slot of the primary receiver.

- The RSat 900 NG receiver is set to PPM output and the primary receivers "Sat1" slot is set to PPM input.

RC Switch

Magnetic Switch

Rsat900 NG (E1/R3)

Rsat2 (R2)

Rsat2 (R1)

SERVO standard

SERVO standard