



® Remote Control „HT-4“ 2.4 GHz

Item no. 1310036

Version 03/15



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1. Introduction

Dear Customer,

thank you for purchasing this product.

This product complies with the statutory national and European requirements.

To maintain this status and to ensure safe operation, you as the user must observe these operating instructions!



These operating instructions are part of this product. They contain important notes on commissioning and handling. Also consider this if you pass on the product to any third parties.

Keep these operating instructions for future reference!

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If there are any technical questions, please contact:

International: www.conrad.com/contact

United Kingdom: www.conrad-electronic.co.uk/contact

2. Explanation of Symbols



The symbol with the exclamation mark points out particular dangers associated with handling, function or operation.



The „arrow“ symbol indicates special advice and operating information.

3. Intended Use

The 4-channel remote control „HT-4“ is solely designed for private use in the field of model construction and the operating times associated with it. This system is not suitable for industrial use, such as controlling machines or equipment.

Any use other than that described above can damage the product and involves additional risks such as short circuit, fire, electric shock, etc. The product must not be technically changed or converted! The safety information must be observed at all times!



Observe all safety information in these operating instructions. They contain important information on handling of the product.

You are solely responsible for the safe operation of your remote control and your model!

4. Product Description

The 4-channel remote control system „HT-4“ is a radio control system that is mainly ideal for controlling model planes. If necessary, the remote control can also be used to control model vehicles, model ships or simple 4-channel model helicopters (speed-controlled).

The four proportional control channels can be used to remote-control the different control functions independently of each other. The ergonomic casing fits comfortably into your hand and allows for easy and safe operation of the model and the transmitter.

For operation, 4 AA/mignon batteries (e.g. Conrad item no. 652507, pack of 4, order 1x) are required for the transmitter.

Where no flight controller with BEC switch is used, you also need 4 AA/mignon batteries for the receiver (e.g. Conrad item no. 652507, order once) or 4 AA/mignon rechargeable batteries with the corresponding battery holder. Alternatively, 4- or 5-cell NiMH receiver batteries (rated voltage 4.8 - 6.0 V) can also be used with the switch cable. The receiver may also be operated with a 2-cell LiPo battery (rated voltage 7.4 V), but the connected servos also must be high-voltage-capable.

5. Scope of Delivery

- Remote Control Transmitter
- Remote control receiver
- Binding plug
- Operating instructions on CD

6. Safety Information



The guarantee/warranty will expire if damage is incurred resulting from non-compliance with these operating instructions. We do not assume any liability for consequential damage!

We do not assume any liability for property damage and personal injury caused by improper use or non-compliance with the safety instructions! In such cases the warranty/guarantee is voided.

Normal wear and tear in operation and damage due to accidents (like the receiver aerial being torn off, the receiver casing broken etc.) are excluded from the warranty.

Dear customer, these safety instructions are not only for the protection of the product but also for your own safety and that of other people. Therefore, read this chapter very carefully before taking the product into operation!

a) General Information

- The unauthorised conversion and/or modification of the product is prohibited for safety and approval reasons (CE).
- This product is not a toy and not suitable for children under 14 years of age.
- The product must not get damp or wet.
- Taking out private liability insurance is recommended. If you already have one, get some information on whether or not the operation of a radio-operated model is covered by your insurance.
- Do not connect the drive motor to electric models before the receiver system has been installed completely. This ensures that the drive motor does not start unintentionally.
- Do not leave packaging material unattended. It may become a dangerous toy for children.
- Please check the functional safety of your model and of the remote control system each time before you use the model. Watch out for any visible damage such as defective plug connections or damaged cables. All movable parts on the model have to be running smoothly. However, there must be no tolerance or 'play' in the bearing.
- The operation and handling of RC models must be learned! If you have never controlled such a model, start especially carefully to get used to how it responds to the remote commands. Do be patient!
- Should questions arise that are not answered with the help of this operating manual, contact us (contact information, see chapter 1) or another expert.

b) Operation

- If you do not yet have sufficient knowledge on how to deal with remote-controlled models, please contact an experienced model sportsman or a model construction club.
- When putting the device into operation, always turn on the transmitter first. Then switch on the receiver in the model. Otherwise, the model might show unpredictable responses!
- Avoid directing the tip of the aerial directly towards your eyes. The range reduces strongly.
- Before operating the model, check whether the stationary model reacts as expected to the commands of the remote control.

- When you operate the model, always make sure that no parts of your body, other people or objects come within the dangerous range of the motors or any other rotating drive parts.
- Improper operation can cause serious damage to people and property! Always make sure that the model is in your line of sight and do not operate it at night.
- Only operate your model if your ability to respond is unrestricted. Fatigue or the influence of alcohol or medication can lead to wrong responses.
- Operate your model in an area where you do not endanger any persons, animals or objects. Only operate it on private sites or in places which are specifically designated for this purpose.
- In case of a fault stop operating your model straight away and remove the cause of malfunction before you continue to use the model.
- Do not operate your RC system during thunderstorms, beneath high-voltage power lines or in the proximity of radio masts.
- Never switch off the remote control (transmitter) while the model is in use. To switch off the model, always switch off the motor first, then switch off the receiver. Only then may the remote control be switched off.
- Protect the remote control from dampness and heavy dirt.
- Do not expose the remote control to direct sunlight or excessive heat for a long period of time.
- If the batteries in the remote control are low, the range decreases. If the receiver batteries or rechargeable battery in the receiver are low, the model will not respond correctly to the remote control.

If this is the case, stop driving immediately. Replace the batteries with new ones or recharge the receiver's rechargeable battery.
- Do not take any risks when operating the product! Your own safety and that of your environment depends completely on your responsible use of the model.

7. Notes on Batteries and Rechargeable Batteries

- Keep batteries/rechargeable batteries out of the reach of children.
- Do not leave any batteries/rechargeable batteries lying around openly. There is a risk of batteries being swallowed by children or pets. If swallowed, consult a doctor immediately!
- Batteries/rechargeable batteries must never be short-circuited, disassembled or thrown into fire. There is a danger of explosion!
- Leaking or damaged batteries/rechargeable batteries can cause chemical burns to skin on contact; therefore, use suitable protective gloves.
- Do not recharge normal batteries. There is a risk of fire and explosion! Charge only rechargeable batteries intended for this; use suitable chargers.
- Always observe correct polarity (positive/+ and negative/-) when inserting the batteries/rechargeable batteries.
- If the device is not used for an extended period of time (e.g. storage), remove the inserted batteries/rechargeable batteries from the remote control and the car to avoid damage from leaking batteries/rechargeable batteries.
- Recharge the rechargeable batteries about every 3 months. Otherwise, so-called deep discharge may result, rendering the rechargeable batteries useless.
- Always replace the entire set of batteries or rechargeable batteries. Never mix fully charged batteries/rechargeable batteries with partially discharged ones. Always use batteries or rechargeable batteries of the same type and manufacturer.
- Never mix batteries and rechargeable batteries!
- For reasons of operational safety, only use batteries and rechargeable batteries for the remote control transmitter.

8. Charging Rechargeable Batteries

If you use rechargeable batteries for power supply of the receiver, they are usually flat at delivery and must be charged.



Note:

Before a rechargeable battery reaches maximum capacity, several complete discharge and charge cycles are necessary.

Always discharge the rechargeable battery at regular intervals, since charging a „half-full“ rechargeable battery several times can cause a so-called lazy battery effect. This means that the rechargeable battery loses capacity. It no longer provides all of its stored energy, and the operating time of the model is reduced.

If you use several rechargeable batteries, purchasing a high-quality charger may be worthwhile. Such a charger usually has a quick-charging feature.

9. Transmitter Controls

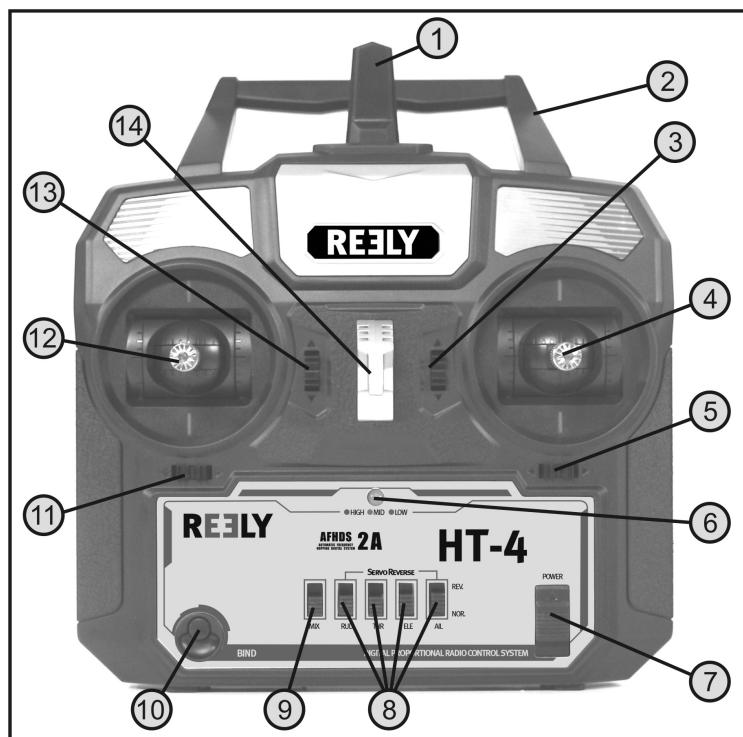


Figure 1

- | | |
|---|--|
| 1 Transmitter aerial | 10 Binding button |
| 2 Carrying handle | 11 Trim button for rudder function |
| 3 Trim button for elevator function | 12 Control lever for rudder and motor function |
| 4 Control lever for elevator and aileron function | 13 Trim button for motor function |
| 5 Trim button for aileron function | 14 Carrying belt eyelet |
| 6 LED Display | |
| 7 On/off switch | |
| 8 Reverse switch | |
| 9 Delta mixer switch | |

10. Setting up the Transmitter



In the further course of these instructions, figures in the text always refer to the adjacent figure or the figures within the section. References to other figures are indicated with the corresponding figure number.

a) Inserting the Batteries

For the power supply of the transmitter you will need 4 alkaline batteries (e.g. Conrad item no. 652507, pack of 4, order 1) of the size AA/mignon.

Proceed as follows to insert the batteries:

The battery compartment lid (1) is located on the back of the transmitter. Press the corrugated area (2) and push off the lid downwards.

Ensure that the polarity is correct when inserting the 4 batteries. A corresponding note (3) is located on the bottom of the battery compartment.

Then slide the lid of the battery compartment back on from the bottom until the locking mechanism engages.

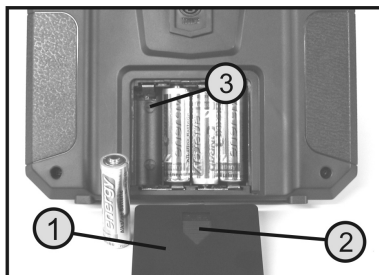


Figure 2

b) Switching on the Transmitter

When new batteries are inserted, switch on the transmitter with the function switch (see figure 1, item 7) for test purposes. For this, slide the operating switch from the bottom (off) to the top (on).

The transmitter emits a short signal sound and the LED display (also see figure 1, item 6) lights up green permanently.

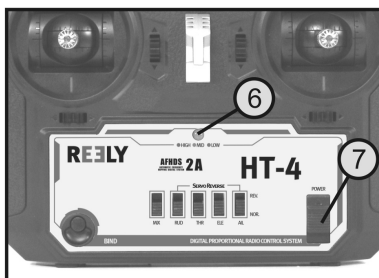


Figure 3

If the voltage supply drops below 5 V, the LED display switches from green to orange to red and thus indicates threatening undersupply of the transmitter. The model should then no longer be operated.

When the voltage drops below 4.2 V, the LED display starts flashing red and the transmitter emits acoustic warning sounds at regular intervals. In this case, operation of the model must be ceased as quickly as possible. Insert new batteries for further operation of the transmitter.

After you have verified the correct function of your transmitter, switch it off again.

c) Setting the Control Lever Length

You can adjust the length of the control sticks, depending on your steering habits.

To do so simply hold the bottom part of the grip (1) and turn the upper part (2) up anti-clockwise.

You can now set the length of the control stick by turning the bottom part of the grip.

Finally, tighten the upper part of the grip back up.

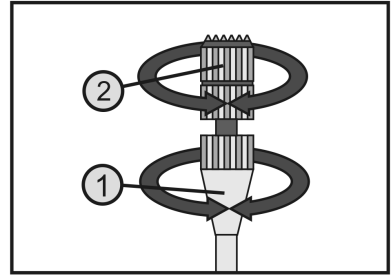


Figure 4

11. Setting up the Receiver

a) Receiver Connection

The receiver offers the possibility of connecting 4 servos (receiver output „CH1“, „CH2“, „CH3“ and „CH4“) that are later assigned the following control functions in the model:

„CH1“ = Aileron/roll servo

„CH2“ = Elevator/nod servo

„CH3“ = Throttle servo or flight/drive controller

„CH4“ = Rudder/tail servo

The receiver outputs „CH5“ and „CH6“ are not used, since the transmitter only transmits the first four channels.

At the „BAT“ connection, a battery box (1) or a receiver battery with switch cable (2) is connected if no flight/speed controller with BEC switch is used.

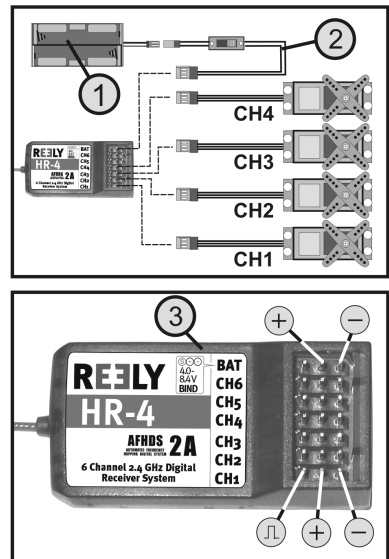


Figure 5



Important!

When using servos with high power demand, we recommend that you always use a high-current-capable receiver battery pack.

The connections are designed for JR plug connectors. If required, Futaba plugs can be used as well, if a key file or a sharp knife is used to remove the narrow guide bridge at the plug.

When connecting servos and speed controllers, always make sure of correct polarity of the plug connectors. The plug-in connection for the positive lead (yellow, white or orange, depending on the manufacturer) must be connected to the inner (left) pin contact. The plug-in connection for the negative lead (black or brown, depending on the manufacturer) must be connected to the outer (right) pin contact.

First, switch on the transmitter and then the receiver. If the binding function is working correctly, the red LED indicator in the receiver (see figure 5, item 3) lights up and the four servos react to the movements of the control levers. Verify correct receiver function and then switch the receiver off again.



If the servos do not react and the LEDs in the receiver do not light up, perform binding (see chapter 19).

b) Installing the Receiver

Installation of the receiver depends on the model. For this reason, you should always follow the recommendations of the model manufacturer regarding the installation.

Regardless of the model, you should always try to install the receiver so that it is protected from dust, dirt, moisture, heat and vibration in the best possible way.

Keep enough distance from motors and electronic flight or speed controllers. Metal or carbon parts have a shielding effect and thus may considerably impair reception. In this case, it is sensible to relocate the aerial outwards through a bore in the fuselage.

Two-sided adhesive foam (servo tape) or rubber rings that hold the foam-wrapped receiver securely in place are suitable for fastening.



Attention!

The aerial wire (1) length is determined precisely.

For this reason, you must not roll up the wire, place it in a loop or cut it off. This would decrease the range significantly and thus pose a considerable safety risk.

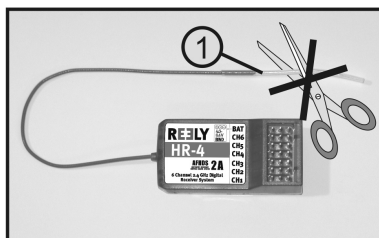


Figure 6

12. Installing the Servos

The installation of a servo (1) always depends on the particular model used.

Detailed information on this can be found in the construction documents of the model.

Generally, however, try screwing in the servos in a vibration-dampened manner. This is why rubber bushings (2) with metal sleeves (3) are usually included with the servos.

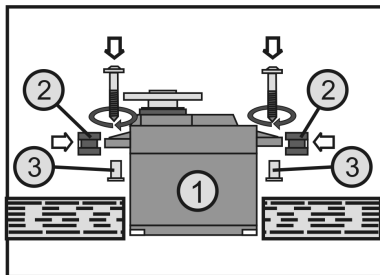


Figure 7

When servos are obstructed, the servos cannot assume the required positions. This causes higher power consumption and the model cannot be controlled properly. The linkages must work as smoothly as possible without having any play in the bearings or deflections.

Before installing the servo lever, take the transmitter and then the receiver into operation and check the trim at the remote control transmitter for correct middle position (see following chapter).

Then always mount the servo stick at a 90° angle to the linkage rods (see figure 8, sketch A).

The servo lever is at an angle to the linkage rod (see figure 8, sketch B), the control paths of the two control directions will be unequal.

A slight mechanical inclination due to interlock of the servo levers may be corrected with the trim later.

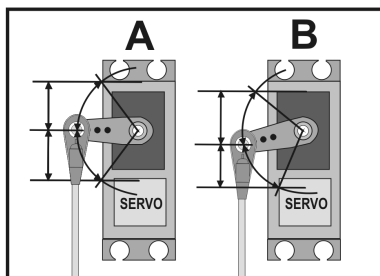


Figure 8

13. Setting the Trim

The trim mostly serves to correct the slight inclination of the servo levers due to the interlock and the connected irregular control movements.

Additionally, there is the option to adjust the model in operation precisely, e.g. if it is not flying straight although the control lever is in the middle position.

Then the linkage or rudder rods must be adjusted so that the trim has its original value (90°-range between servo lever and linkage) again and the model still runs straight.

The remote control „HT-4“ has a finely tuned digital trimming with which each control channel can be individually set with a trimming button (also see figure 1, items 3, 5, 11 and 13).

The trimming buttons are assigned the following control functions:

- 3 Trimming button for elevator servo „CH2“
- 5 Trimming button for aileron servo „CH1“
- 11 Trimming button for aileron servo „CH4“
- 13 Trimming button throttle servo „CH3“

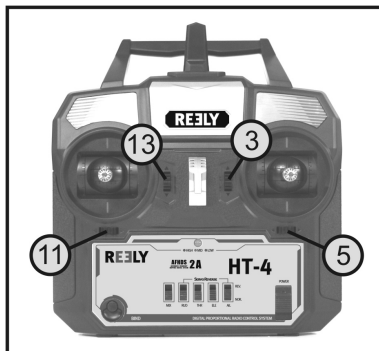


Figure 9

To check the setting of the digital trimming, first switch on the transmitter and then the receiver. If a trimming button is moved to the side or up or down and held, the transmitter will emit brief signal sounds in a quick sequence. The servo of the respective control channel will change the position of the servo lever in small steps.

When the end of the trimming range is reached, the signal sounds go out and the servo lever stops turning. If the trimming button is then deflected in the opposite direction and held, the signal sounds sound again and the servo lever turns back to the middle position step by step.

When the middle position of the trimming range has been reached, the remote control issues a longer signal sound.

Now set the middle positioning of the trimming in all four channels and install the servo levers so that they are at a 90° angle to the rods. Since the servo levers and the servo axis are interlocked, very small inclinations of the servo lever cannot always be avoided. In this case, the trimming of the respective channel must be adjusted slightly from the middle to return to the 90° angle of the servo lever to the linkage rod (see figure 8).



The set trim value is automatically saved in the remote control and is retained even after switching it off and on.

When using the electrical model with a flight controller, the trim for channel 3 also needs to be set to the middle value.

14. Checking the Servo Directions of Travel

Connect the servos inserted in the model to the receiver. Pay attention to the assignment of the receiver outputs as described above.



If your model has two aileron servos, there is the possibility of operating both servos with a V-cable at the receiver output „CH1“.

Take the transmitter into operation, then the receiver. If attached correctly, the servos at outputs 1, 2, 3 and 4 should react in the right direction to the movements of the control levers according to the illustrations in figure 10. The linkage rods of the rudders must be adjusted so that the rudders are all aligned precisely centrally if the control lever and the trimming are in the central position (also see top sketch in figure 10).

The next page, figure 10, shows a schematic illustration of the rudder deflections in the respective control lever movements.



The left control lever for motor control can be pushed forward and back without being moved back to the middle position by spring force. It always remains in the position into which it was last moved.

An electronic motor controller connected at the receiver output „CH3“ must be set so that an electric motor is off when the left control lever is in the bottom position. If the model is operated with a combustion engine, the throttle servo linkage must be adjusted so that the motor runs idle when the carburettor is nearly closed. Only when the trim for the motor function is also pushed all the way to the bottom, the carburettor must close completely so that the combustion engine is switched off.

If the control lever is pushed to the top-most position, the throttle in the carburettor must be completely opened so that the motor can run at full power.

For electrical models, the flight controllers often offer the option to teach in the respective positions for motor off and maximum performance. Further information on this can be found in the operating instructions of the flight controller.



Attention!

Only perform the motor test in an electric model when the model is reliably secured against rolling away. Make sure that neither objects nor body parts are in the rotating and suction areas of the propeller during the motor test.

If the servos or rudders react in precisely the opposite manner as shown in figure 10, the reverse switches (see following chapter) can swap the running direction of the respective servo.



Important!

Always switch on the transmitter first, then the receiver. When you switch off the devices, always switch off the receiver first, then the transmitter.

Never switch off the remote control as long as the receiver is in operation. This can lead to unexpected reactions by the model!

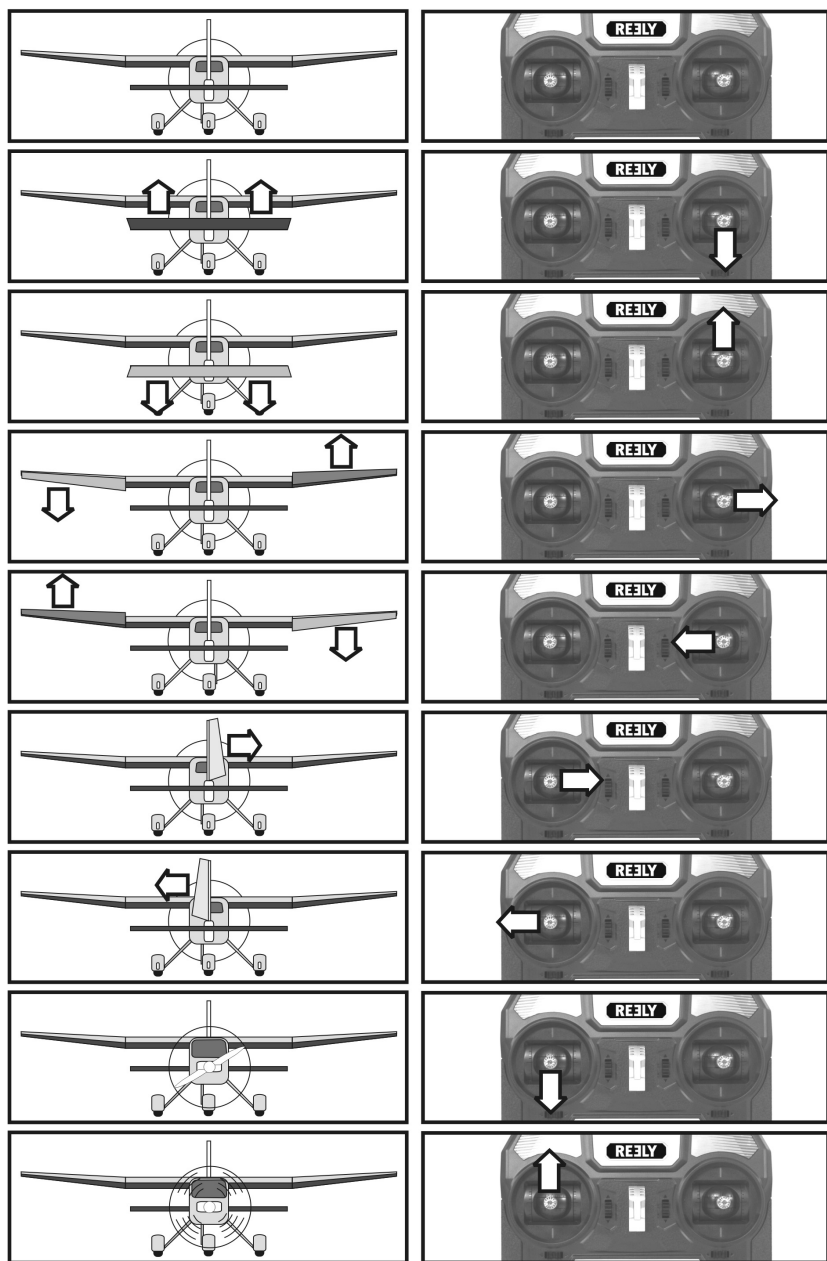


Figure 10

15. Switching the Servo Directions of Travel

If the rudder movements are not according to figure 10, you can switch the running direction of every single servo with the reverse switches (also see figure 1, item 8). The switches are assigned as follows:

„AIL“ = Aileron/roll servo

„ELE“ = Elevator servo

„THR“ = Throttle servo/flight controller

„RUD“ = Rudder/tail servo

If the switch is in the bottom position, the „regular“ running direction is set. If the switch is pushed to the top position, „reversed“ running direction is activated.

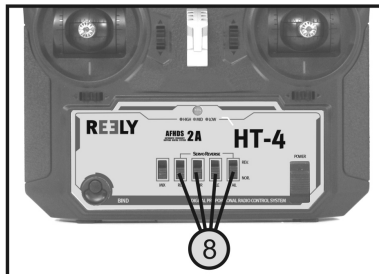


Figure 11



Observe that the centre position of the servo/rudder may have to be adjusted after switching.

16. Changing the Control Stick Allocation

If you want to control your flight model according to the chart shown in figure 10 (mode II), you can skip this section. If you prefer the throttle function on the right control lever and the elevator function on the left one (Mode I), you may convert the transmitter accordingly.

To make the necessary changes, some experience with remote control transmitters is required. Therefore you should consult an experienced model maker or a model construction club if you do not feel capable of undertaking the procedures described in the following.

Proceed as follows:

- Remove the transmitter batteries.
- Unscrew the four screws by means of a Phillips-tip screwdriver from the rear panel of the transmitter and lift the rear panel carefully.
- After you have disconnected the plug connector of the student socket (1), you can fold the rear of the transmitter down.

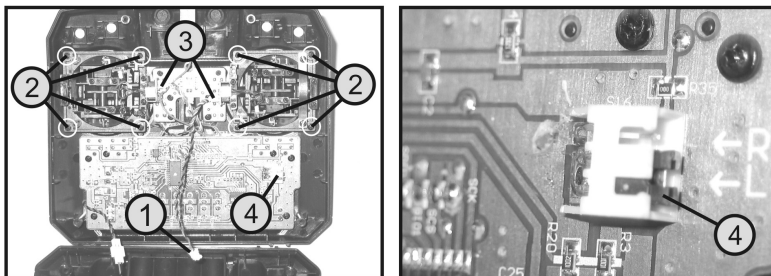


Figure 12

- For this, loosen the four screws at the control lever units (2) and swap the two units. You need to turn the control lever units by 180° each so that the connections of the control lever potentiometers (3) are aligned to the inside again.
- Then screw on the control lever units again.
- Use pointed pliers or pincers to pull the jumper (4) from the position „L“ and reinsert it in position „R“.
- Then close the connection plug of the student socket again and place the rear panel on the transmitter housing.
- Turn in the four attachment screws.
- Insert the transmitter batteries and check for correct function of the remote control.

17. Delta Mixer

The remote control „HT-4“ has a delta mixer that can be activated with the mixer switch (also see figure 1, item 9). When the slider is in the bottom position, regular operation without mixer function is active. When the slider is put up, the delta mixer is activated.

For a delta plane model with triangular wing, the ailerons also have to perform the elevator function. For this reason, the channels „CH1“ (aileron) and „CH2“ (elevator) are mixed in the delta mixer. Independently of whether the transmitter controls the aileron or elevator function then, the two servos at the receiver outputs „CH1“ and „CH2“ will always react at the same time then.

The servo of the right wing has to be connected to the receiver output „CH1“ and the servo of the left wing to the receiver output „CH2“. The deflections of the two rudder flaps have to be according to the figures in figure 13.

If required, the servo directions can be corrected with the reverse switches (see chapter 15).

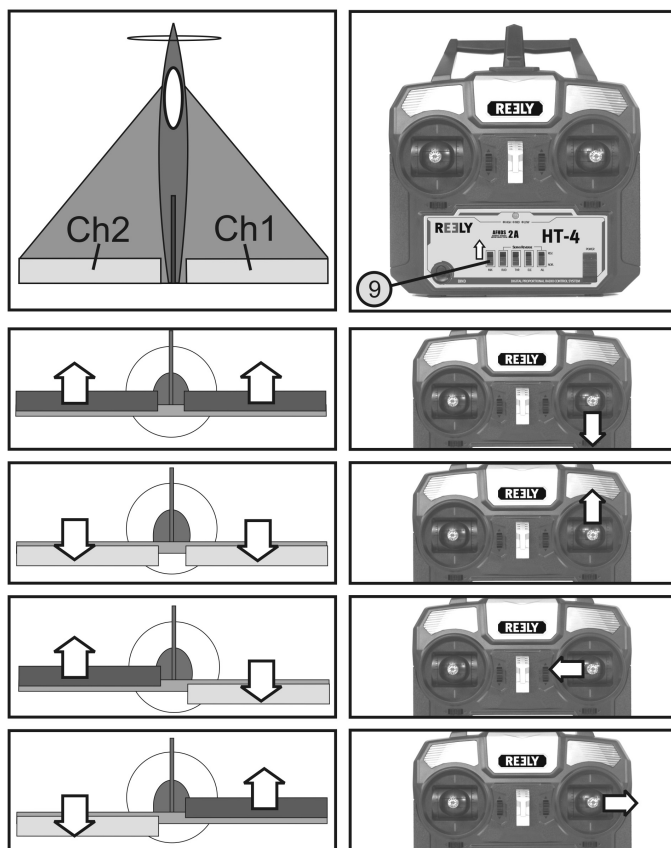


Figure 13

18. Switching the Digital Code

The remote control transmitter enables you to control receivers with the digital code „AFHDS“ and „AFHDS2A“. Ex works, the transmitter is set to the enclosed „AFHDS2A“-encoded receiver.

If you want to operate a REELY receiver with the digital code „AFHDS“, the transmitter must be switched first and then the receiver must be bound to the transmitter (see following chapter).

To switch the digital code at the transmitter, proceed as follows:

- Switch off the transmitter.
- Move the two control levers to the lower left corner and keep it there.
- Switch on the transmitter with the on/off switch with the control levers deflected.
- Release the two control levers so that they move to the centre position.
- If the LED display flashes, the transmitter has switched to the digital code „AFHDS“. If the LED display flashes and the remote control also issues short signal sounds in a cycle of one second, the transmitter has switched to the digital code „AFHDS2A“.
- Switch off the transmitter so that the currently set digital encoding is saved.

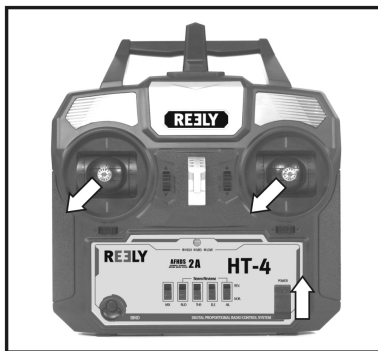


Figure 14



Important!

The receiver enclosed with the remote control system „HT-4“ works with code „AFHDS2A“. Therefore, always observe that the right code is programmed at the transmitter!

19. Binding Function

To enable transmitter and receiver to work together, they must be bound by the same digital code. In the delivery state, transmitter and receiver are aligned with each other and can be used at once. The binding settings must be renewed mainly after a replacement of the transmitter or receiver or to remove any interferences.

Before you can bind the receiver to the transmitter, check if the transmitter works in the right digital code (see previous chapter).

To perform the binding procedure, proceed as follows:

- Transmitter and receiver must be in direct proximity (distance approx. 50 cm).
- Switch off the transmitter.
- Disconnect any servos that may be connected from the receiver.
- Connect the enclosed programming plug (1) to the „BAT“ connection of the receiver.
- The power supply of the receiver (receiver battery or speed controller with BEC) is connected to any output of the receiver.
- Switch on the receiver. The receiver LED (2) starts to flash quickly.
- Press the binding button at the receiver (see also figure 1, item 10) and keep the button pressed.
- Switch on the transmitter with the on/off switch with the binding button pushed. The LED display in the transmitter starts to flicker.
- When the LED in the receiver (2) flashes slowly after a few seconds, binding, binding has been completed.
- Release the binding button at the transmitter.
- Switch off the receiver and transmitter and remove the programming plug.
- Re-connect the servos/controllers to the receiver.
- Check the function of the system. If the system is not working properly, perform the process again or check the digital code of the transmitter.

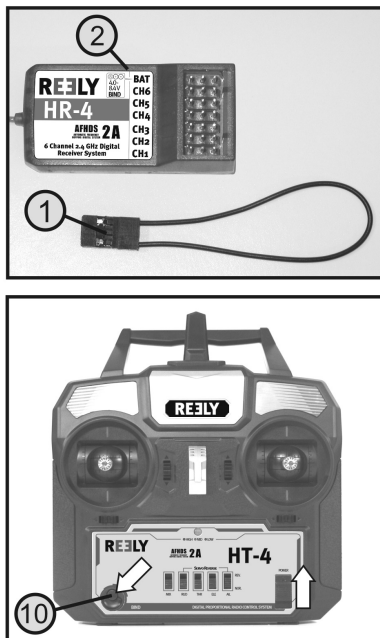


Figure 15



If you have switched the transmitter to the digital code „AFHDS“ and bind an „AFHDS“ receiver, the LED in the receiver will not flash slowly but be lit permanently after binding.

20. Simulator/Student Transmitter Function

If required, you can also use the transmitter at the PC for simulations or games. In this case, you will require the optional USB cable (Conrad item no. 517956) and suitable computer software (e.g. flight simulation games, etc).

The USB cable is connected to the PS/2 interface socket (16) at the rear of the transmitter.

At correct connection and proper installation, the activated transmitter is recognised by the operating system (e.g. at least Windows XP or higher required) and can be used like a commercial joystick.

For all further information on this, see the operating instructions of the USB cable.

Alternatively, the signal output of the remote control may be used to control a teacher transmitter. In this case, the remote control „HT-4“ acts as the student transmitter. Further information on this can be found in the operating instructions of the teacher transmitter.

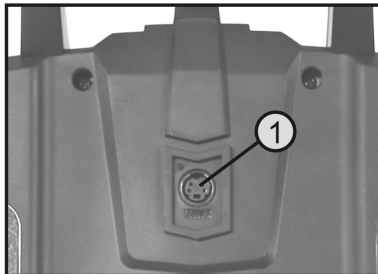


Figure 16

21. Maintenance and Care

Clean the exterior of the remote control with a soft, dry cloth or brush only. Never use abrasive cleaning agents or chemical solutions as these could damage the surfaces of the casings.

22. Declaration of Conformity (DOC)

The manufacturer hereby declares that this product complies with the essential requirements and regulations and all other relevant provisions of the 1999/5/EC directive.



The compliance statement for this product is available at www.conrad.com.

23. Disposal

a) General Information



The product does not belong in the household waste!

At the end of its service life, dispose of the product according to the relevant statutory regulations.



Remove any inserted batteries or rechargeable batteries and dispose of them separately from the product.

b) Batteries and Rechargeable Batteries

You as the end user are required by law (Battery Ordinance) to return all used batteries/rechargeable batteries. Disposing of them in household waste is prohibited!



Batteries and rechargeable batteries containing hazardous substances are marked with the adjacent symbol to indicate that disposal in the household waste is prohibited. The descriptions for the respective heavy metals are: Cd=cadmium, Hg=mercury, Pb=lead (the names are indicated on the battery/rechargeable battery e.g. below the rubbish bin symbol shown to the left).

You may return used batteries/rechargeable batteries free of charge at the official collection points in your community, in our stores, or wherever batteries/rechargeable batteries are sold.

You thus fulfil your statutory obligations and contribute to the protection of the environment.

24. Troubleshooting

Even though the remote control system was built to the state of the art, there can still be interference or faults. For this reason, we would like to give you some information on how to deal with possible problems.

Problem	Remedy
Transmitter doesn't respond	<ul style="list-style-type: none">• Check the batteries in the transmitter.• Check the polarity of the batteries.• Check the battery contacts of the remote control.• Check the on/off switch.
The servos do not respond	<ul style="list-style-type: none">• Check the batteries in the receiver.• Test the switch cable.• Test the BEC function of the controller• Check the polarity of the servo connector.• Check digital code.• Perform binding.• For test purposes, change the receiver and bind again.
The servos vibrate	<ul style="list-style-type: none">• Check batteries in the remote control and the receiver.• Check connectors on the receiver.• Dry the receiver with a hair dryer in case it has gotten wet.• Check the receiver aerial for damage.• Reorient the receiver aerials in the model for test purposes.
One servo is humming	<ul style="list-style-type: none">• Check the batteries in the receiver.• Make sure the linkage rods run smoothly.• Operate the servo without the servo arm for test purposes.
The range of the system is very short	<ul style="list-style-type: none">• Check the batteries in the receiver.• Check the receiver aerial for damage.• Install the receiver aerial in a different position in the model for test purposes.
Transmitter switches off on its own at once or after a short period	<ul style="list-style-type: none">• Check or replace the batteries in the transmitter.

25. Technical Data

a) Transmitter

Frequency range	2.4 GHz
Number of channels	4
Encoding.....	AFHDS / AFHDS2A (Automatic Frequency Hopping Digital System)
Signal output.....	PS/2 socket (PPM)
Operating voltage	6 V/DC via 4 type AA/mignon batteries
Dimensions (W x H x D)	174 x 187 x 80 mm
Weight without batteries	approx. 330 g

b) Receiver

Frequency range	2.4 GHz
Number of channels	6
Encoding.....	AFHDS2A
Connector system.....	Graupner JR
Operating voltage	4.0 to 8.4 V/DC
Dimensions (W x H x D)	45 x 23.5 x 13.5 mm
Weight	approx. 8 g

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