

# REELY

**Ⓒ Operating Instructions**  
**Quadrocopter „Shadow 2.0“ RTF**  
**Item no. 1400004**

Version 10/16



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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 party.

Therefore, retain these operating instructions for reference!

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If there are any technical questions, please contact:

International: [www.conrad.com/contact](http://www.conrad.com/contact)

United Kingdom: [www.conrad-electronic.co.uk/contact](http://www.conrad-electronic.co.uk/contact)

# 2. Explanation of Symbols



The symbol with a lightning bolt in a triangle is used where there is a health hazard, e.g. from electric shock.



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

This product is an electrically powered helicopter-like model with wireless radio control via the remote control system included in the delivery. The quadcopter is solely designed for private use in the field of model construction and the operating times associated with it.

The model is designed for operation outdoors but may also be used in sufficiently sized rooms (e.g. gyms) if required.

The enclosed LiPo flight battery can be charged with an enclosed charger.

This system is not suitable for other types of use. 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 get damp or wet.

The product is not suitable for children under 14 years of age.



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. Scope of Delivery

- Quadcopter with 2D-gimbal, assembled ready to fly
- Radio remote control transmitter with GPS aerial
- Flight battery with integrated electronics
- Mains unit with charge adapter
- Mains connection cable
- USB cable
- Exchange blades screwdriver
- Binding plug
- Operating instructions



#### Latest operating instructions:

1. Open the website [www.produktinfo.conrad.com](http://www.produktinfo.conrad.com) in your browser or scan the QR code on the right.
2. Select the type of document and the language and then enter the corresponding order number into the search box. Start searching and download the documents found.



## 5. Product Description

The ready-to-fly quadcopter has 4 separate motors that drive one propeller each. Concurrent acceleration of all propellers permits the quadcopter to lift off of the ground and hover stably in the air at the corresponding propeller speeds.

The enclosed remote control permits controlling the quadcopter specifically to the desired flight altitude and direction.

The installed GPS receiver enables the quadcopter to orient itself in the open field to independently perform complex flight manoeuvres. Another GPS receiver that is connected to the remote control transmitter enables the quadcopter to automatically follow the moving transmitter.

To better recognise the alignment of the model in flight, the two arms pointing forward are lit white from below, the ones pointing back are lit red. The current operating condition of the quadcopter is displayed with status LEDs.

The enclosed 2.4 GHz radio remote control system may be switched from „Mode 2“ to „Mode 1“ without any great effort and permits detailed control of the model.

Below the quadcopter, a camera holder (2D gimbal) that is stabilised around two axes is installed. It may hold action cams of the GoPro type or corresponding cameras with the same dimensions, and permits a perfectly calm video in flight.



### Legal note:

Observe the legal basics of your country regarding photographs and videos of persons, objects and facilities, as well as their publication. You alone are taking full responsibility if use of the quadcopter as a camera carrier violates any rights, laws or regulations.

Commercial use of the quadcopter requires a flight permission in Germany.

Also observe applicable provisions under flight law, such as the max. permissible flight altitude or flight prohibitions for models in direct proximity of airfields or military facilities. Find out in how far these or other provisions and regulations must be observed and complied with at the planned site of use.

Even though the quadcopter can fly autonomously, you alone are responsible for use of the flight unit.

For operation of the transmitter, 4 AA/mignon batteries (e.g. Conrad item no.: 652506, order 4x) are required.

## 6. Safety Information



**In case of damage caused by non-compliance with these operating instructions, the warranty/guarantee will expire. 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 during operation (e.g. worn-out motor-shaft bearings) are excluded from the guarantee and warranty, the same is the case for accidental damage (e.g. broken housing parts or propellers).

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



#### **Caution, important note!**

Operating the model may cause damage to property and/or individuals. Therefore, make sure that you are sufficiently insured when using the model, e.g. by taking out private liability insurance.

If you already have private liability insurance, verify whether or not operation of the model is covered by your insurance before commissioning your model.

Note: In some countries you are required to have insurance for all model aircraft!

- The unauthorised conversion and/or modification of the product is prohibited for safety and approval reasons.
- This product is not a toy and not suitable for children under 14 years of age.
- The product must not get damp or wet.
- As delicate control electronics are used in the quadcopter which are also sensitive to temperature fluctuations and are optimised for a particular temperature range, operation below +10 °C is to be avoided. The product was developed for operation at an ambient temperature between +10 °C and +40 °C and a humidity that is normal for dry weather in Central Europe. Operation under different conditions can lead to changed (material) properties and damage to the product as a result.
- If you do not have sufficient knowledge regarding handling of remote-controlled models, contact an experienced model sportsman or model construction club.
- Do not leave packaging material unattended. It may become a dangerous toy for children.
- Should questions arise that are not answered by these operating instructions, contact us (for contact information, see chapter 1) or another expert.

The operation and handling of remote controlled quadcopters must be learned! If you have never steered such a model, start especially carefully and get used to the reactions of the model to the remote control commands first. Be patient!

## b) Mains Unit

- The mains unit is constructed pursuant to protection class II.
- Use only a proper mains socket of the public mains for voltage/power supply of the mains unit. Use the enclosed mains cable for connection.
- The socket to which the mains unit's connection cable is connected must be easily accessible.
- Do not pull the plug of the mains cable from the mains socket by pulling the cable. Always take the plug and pull it straight from the mains socket.
- Protect the mains unit/mains cable from moisture and wetness as well as from damage.



If the mains unit/mains cable has gotten moist or wet or damaged, do not touch it. Danger to life from electric shock!

First deactivate all sides of the mains socket to which the mains unit/mains cable is connected (e.g. switch off the respective fuse or turn out the fuse. Then deactivate the FI protection switch).

Only then pull the mains plug of the mains cable from the mains socket; no longer use the mains unit/mains cable, but dispose of it environmentally compatibly.

## c) Before Commissioning

- Always first switch on the transmitter and then connect the flight battery to the quadcopter. This is the only way for an attunement function to take place between transmitter and receiver, so that your model will react reliably to the control commands of your transmitter.
- Check the functional safety of the model and remote control system. Watch out for any visible damage such as defective plug connections or damaged cables. All moving parts on the model must run smoothly but must not have any tolerance in the bearing.
- The flight battery required for operation must be charged before operation.
- Ensure that the batteries in the transmitter have a sufficient remaining capacity (transmitter indication). If the batteries are empty, always replace the complete set, never individual cells only.
- Give the quadcopter enough time to receive the required GPS satellites so that the quadcopter can perform autonomous flight manoeuvres. Observe the flashing displays of the status-LEDs.

## d) During Operation

- 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.
- Improper operation can cause serious damage to people and property! Therefore make sure to keep a sufficiently safe distance from persons, animals or objects during operation. Never try to grab the flying model with your hand!
- 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 propellers.
- Only fly your model if your ability to react is unlimited. The influence of tiredness, alcohol or medication can cause incorrect responses.
- Motors, motor regulator and flight battery can heat during operation. For this reason, wait for 10 to 15 minutes before recharging or replacing the flight battery or taking off again with a second, already-charged flight battery.

- Never switch off the remote control (transmitter) while the model is in use. After landing, always switch off the flight battery before the remote control. Then remove the flight battery from the quadcopter.
- Never switch off the remote control while the quadcopter is still in operation.
- Never expose your model and the remote control system to direct solar irradiation or great heat for an extended period.

## 7. Notes on Batteries and Rechargeable Batteries



Although use of batteries and rechargeable batteries in everyday life is a matter of course today, there are many dangers and problems.

Ensure that you observe the following general information and safety information when handling 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! Only charge rechargeable batteries (1.2 V) intended for this purpose. Use suitable battery chargers. Batteries (1.5 V) are intended for one-time use only and must be disposed of properly when discharged.
- Always observe the correct polarity when inserting batteries or connecting the charger (observe plus/+ and minus/-). Incorrect polarity will damage not only the transmitter but also the plane model and the batteries. There is a danger of fire and explosion.
- Always replace the whole set of batteries. Do not mix full batteries with half-full ones. Always use batteries/rechargeable batteries of the same type and manufacturer.
- Never mix batteries and rechargeable batteries! Therefore, only use batteries for the remote control transmitter.
- If the device is not used for an extended period of time (e.g. storage), remove the inserted batteries from the remote control to avoid damage from leaking batteries.



### Attention!

After flying, switch off the flight battery and remove the flight battery from the quadcopter. Do not leave the flight battery in the quadcopter when you are not using the model (e.g. during transport or storage). Otherwise, the flight battery may be fully discharged and is thus destroyed/unusable!

- Never charge the flight battery right after use. Always let the flight battery to cool down until it has reached room or ambient temperature again.
- Only charge intact and undamaged flight batteries. If the outer isolation of the rechargeable battery is damaged or the battery is deformed or bloated, it must not be charged. There is acute danger of fire or explosion!
- Never damage the outer shell of the flight battery, do not cut the foil cover, do not puncture the flight battery with pointed objects. There is a risk of fire and explosion!
- Never recharge the flight rechargeable battery unattended.
- Disconnect the flight battery from the charger when it is charged completely.

## 8. Preparation of the Quadcopter



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) Assemblies, Displays and Attachments

Illustration A in figure 1 shows the quadcopter from the front. Illustration B in figure 1 shows the quadcopter from the rear.

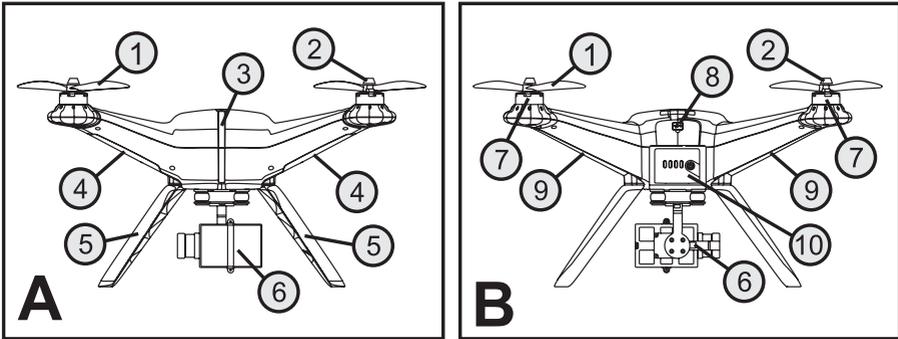


Figure 1

- 1 Propeller
- 2 Propeller nut
- 3 Status LEDs
- 4 Propeller arm lighting front
- 5 Landing frame
- 6 2D-gimbal
- 7 Brushless motor
- 8 USB interface
- 9 Propeller arm lighting rear
- 10 Battery box with LED-display

## b) Assembly of the Propellers

The quadcopter comes with 1 pair of left-turning propellers (1) and 1 pair of right-turning propellers (2) each.



### Important:

Observe the rotating direction of the propellers at installation. The propellers at the front left and the rear right turn clockwise when viewed from above; the propellers on the front right and rear left turn counter-clockwise (see rotating direction arrows in figure 2).

In addition to the motors, circular arrows are placed on the top of the housing to indicate the rotating direction precisely.

The arrow in the upper half of the picture shows the flight direction of the model forwards.

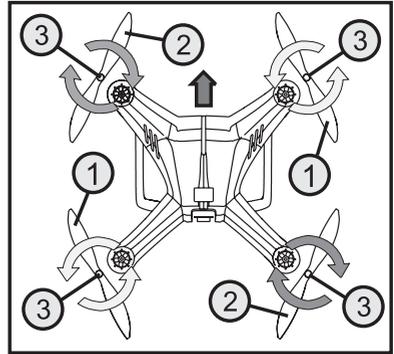


Figure 2



### Attention!

The propellers have glued-in attachment nuts (see figure 2, item 3), which tighten when the quadcopter is in operation.

To attach the propellers, place the respective propellers on the threads of the motor shafts and manually turn the propellers contrary to the regular operating rotating direction. Hold the bell of the brushless motor with the other hand.

Wear protective gloves when installing the propellers to avoid injury from the thin and sharp-edged propellers.

Do not over-tighten the propellers and do not use any threadlocker varnish or glue to secure the propellers.

If a propeller is damaged (cracks or small pieces broken out), replace the defective propeller without delay. Do not continue to use defective propellers.

Stay away from turning propellers to avoid accidental injury.

If the propellers must be replaced, use only the spare propellers provided by the manufacturer.

### c) Stabilised Camera Holder (2 D-Gimbal)

The quadcopter has a camera holder stabilised around two axes (gimbal) installed already. Once the flight battery at the quadcopter is switched on, the holder will automatically align and compensate any nod and roll movements of the quadcopter in flight.

To install a camera of type GoPro or other corresponding cameras (1), the holding bracket (2) must be removed and attached again with the two M2 x 5 screws after inserting the camera. The required screwdriver is enclosed with the quadcopter.



#### Caution, important!

The two transparent plastic covers (3) that are pushed onto the camera holder from the rear and from the side only serve to protect the gimbal when transporting the quadcopter. The covers must be removed before inserting the flight battery or the camera. Otherwise, the gimbal cannot perform the required movements and is thus destroyed!

Never operate the camera holder without a camera inserted. The missing weight of the camera will cause the holder to be unbalanced, which will put too much of a strain on the controlling electronics, which may be damaged.

If the camera holder must be removed from the quadcopter, disconnect the 12-pin plug connector from the corresponding connection in the quadcopter. The camera holder itself is attached to the quadcopter with four screws.



The two-pin plug with the red/black cable is used to supply power to an optional video signal transmitter (red = +12 V/DC, black = GND). Hook-and-loop tape for attaching the video transmitter is enclosed with the quadcopter.

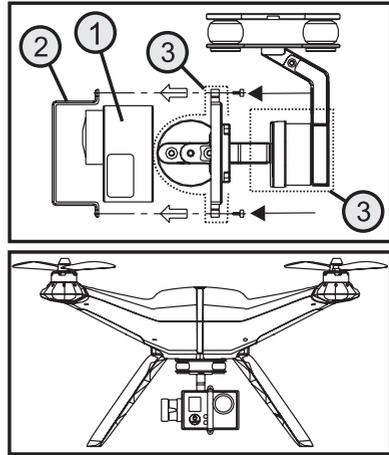


Figure 3

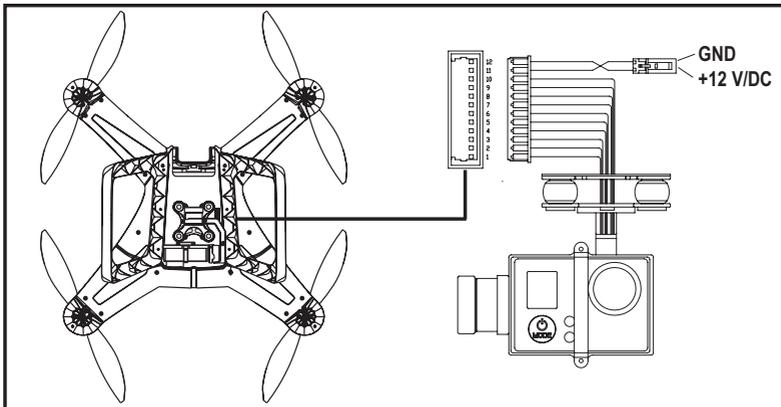


Figure 4

## d) Charging the Flight Battery

The 3-cell flight battery is charged using the enclosed mains unit (1) supplied. For this, open the cover of the charge adapter (2), so that the two large charging contacts (3) are visible.

Connect the flight battery (4) to the charge adapter according to the two middle illustrations in figure 5.

After connecting the enclosed mains cable to the mains unit, connect the mains plug (5) to a proper mains socket of the public mains.

The indicator lamp at the mains unit lights up red to signal that charging is in progress. At the same time, the four LEDs at the flight battery (7) indicate the current charge condition.

When the flight battery is discharged, only LED 1 is lit. With increasing battery charge, LED 2 first starts to flash and then remains lit. This display will also be repeated in LED 3 and LED 4 as charging continues. Before charging is complete, all 4 LEDs will be permanently lit.

When the flight battery is fully charged, the four LEDs at the flight battery (7) will go out and the control indicator at the mains unit (6) will light up green.

Once charging is completed, disconnect the flight battery from the charge adapter and pull the mains plug from the mains socket.



The connection cable of the charge adapter is shown coiled for better illustration in the drawings in figure 5. Before the first charging process, however, you need to remove the cable tie and use the charge adapter cable in the uncoiled condition.

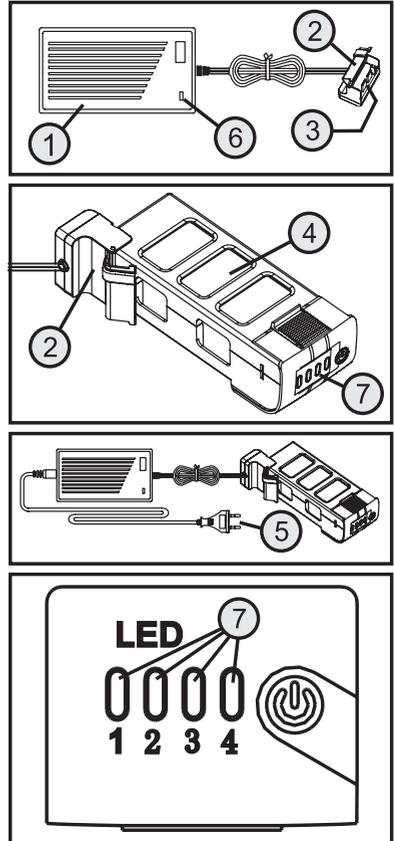


Figure 5



### Attention!

During the charging procedure, place the LiPo battery on a fire-proof support or in an appropriate clay vessel.

Never charge the battery unobserved.



The mains unit/mains cable is to be used in dry indoor locations only. It must never get damp or wet. Never touch them with wet or damp hands. There is the risk of a potentially fatal electric shock!

### e) Testing the Rechargeable Battery Charge Condition

The current charge condition of the flight battery can be tested easily at any time.

For this, briefly push the on/off button (1) at the flight battery. For approx. two seconds, the four LEDs show the current charge condition.

When the flight battery is discharged, only LED 1 will be lit; if it is fully charged, all four LEDs will be lit. At a partially discharged flight battery, e.g., LED 1 and LED 2 would be permanently lit and LED 3 may flash.

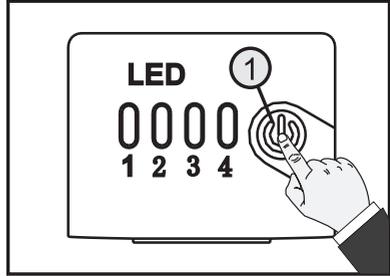


Figure 6



The display of the rechargeable battery voltage above the four LEDs only serves as a general indication. The precise battery voltage can be read in operation of the quadcopter at the transmitter display if necessary.

# 9. Transmitter Controls

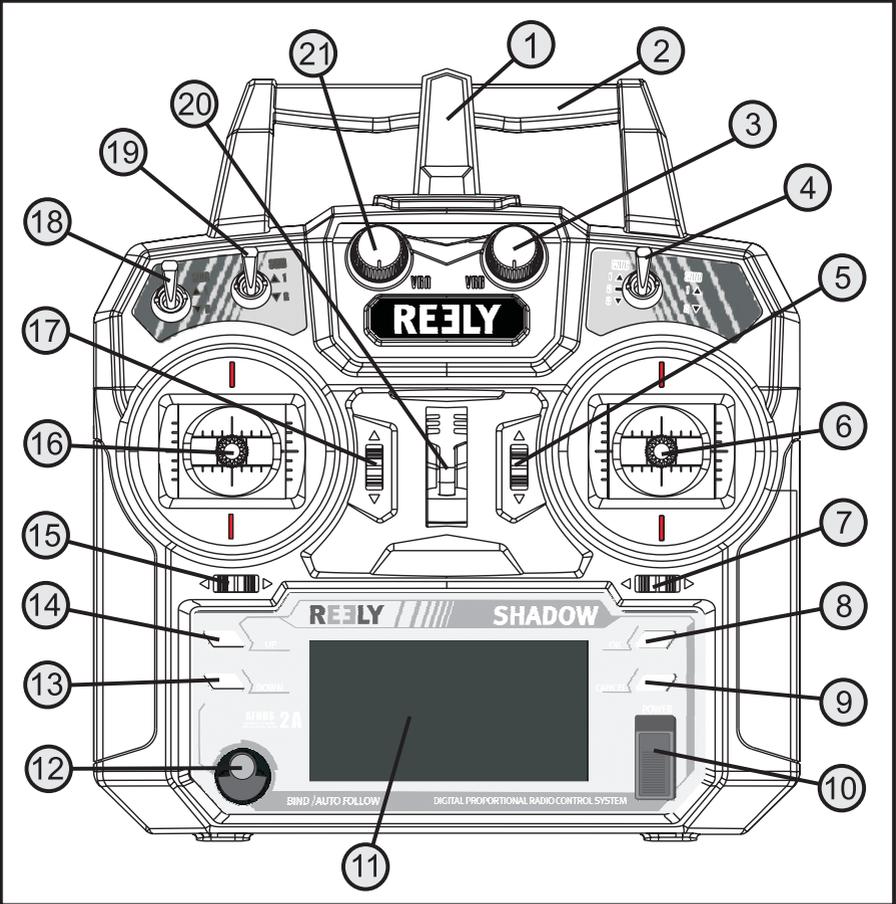


Figure 7

**Front (figure 7):**

- 1 Transmitter aerial
- 2 Carry handle with integrated second transmitter aerial
- 3 Rotary encoder „VRB“
- 4 Toggle switch „GPS“
- 5 Trim button for nod function
- 6 Control stick for nod and roll functions
- 7 Trim button for roll function
- 8 „OK“ button
- 9 Button „CANCEL“
- 10 On/off switch
- 11 LC display
- 12 „BIND/AUTO FOLLOW“ button
- 13 „DOWN“ button
- 14 „UP“ button
- 15 Trim button for yaw function
- 16 Control stick for the yaw and pitch functions
- 17 Trim button for pitch function
- 18 Toggle switch „IOC“
- 19 Toggle switch „GO-HOME“
- 20 Eyelet for shoulder belt
- 21 Rotary encoder „VRA“

**Rear (figure 8):**

- 22 GPS receiver connection socket
- 23 Battery compartment lid

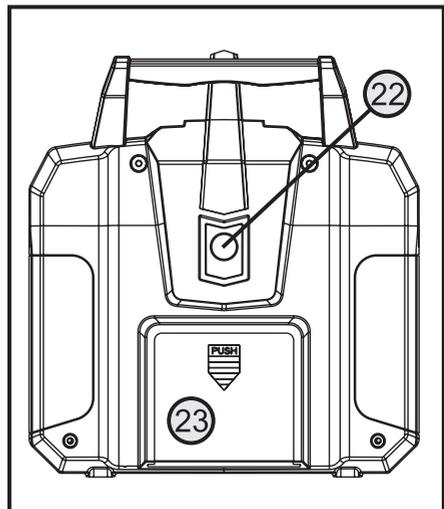


Figure 8

## 10. Setting up the Transmitter

### 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.

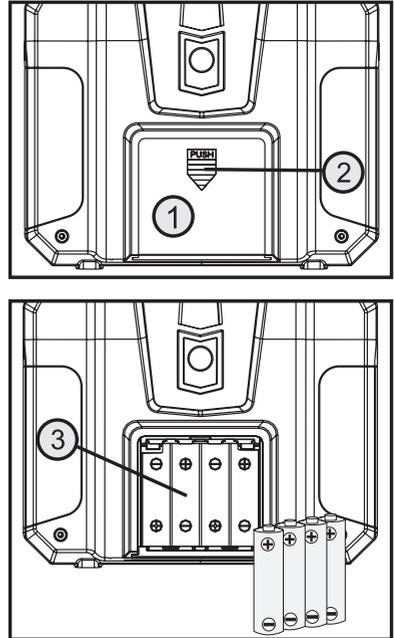


Figure 9

### b) Switching on the Transmitter

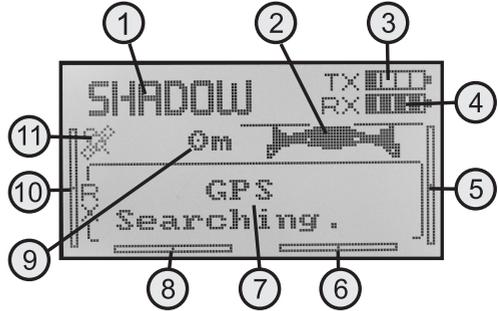
After you have inserted four new batteries, check the position at the toggle switches. All switches must be in the front/top position. The two control sticks are held in the middle position by spring power. Now switch on the transmitter using the on/off switch (see fig. 7, item 10).

First, three signals sound in increasing altitude and the backlit display shows the operating display. The backlighting is deactivated automatically about 20 seconds after activation or the last button operation.

If no operating element is operated within 60 seconds with the transmitter on, the transmitter will emit short signal sounds as a warning.

**The operating display consists of the following elements:**

- 1 Model name
- 2 Model type figure
- 3 Battery symbol for transmitter voltage supply
- 4 Battery symbol for receiver voltage supply
- 5 Nod trimming display
- 6 Roll trimming display
- 7 Information area for status messages
- 8 Yaw trimming display
- 9 Distance display in „Following-Mode“
- 10 Pitch trimming display
- 11 Display for GPS reception of the transmitter\*

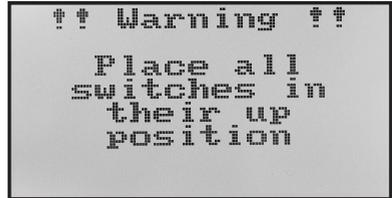


**Figure 10**

\* The display only appears when the GPS receiver has been connected to the transmitter.

➔ If one of the three toggle switches (see figure 7, item 4, 18 and 19) is not in the front position, warning sounds will be emitted when activating and the corresponding note is displayed (see figure 11).

In this case, the affected switches must be put in the required position. The display then switches to the operating display and the warning sounds go out.



**Figure 11**

The operating display shown in figure 10 will only appear completely if the receiver system or quadcopter is in operation as well.

Pushing the button „UP“ or „DOWN“ calls two more display windows alternatingly.

The first window shows the following information:

- Flight altitude „Altitud“
- Flight battery voltage „Voltage“
- Number of received satellites „Satelli“
- Flight speed „Speed“

The second windows shows the following information:

- Geographic longitude „Lon“
- Geographic latitude „Lat“
- Flight mode
- „GPS Mode“

Example in figure 12:

The two upper figures show the displays without GPS reception of the quadcopter. The two lower ones represent a display with GPS reception.

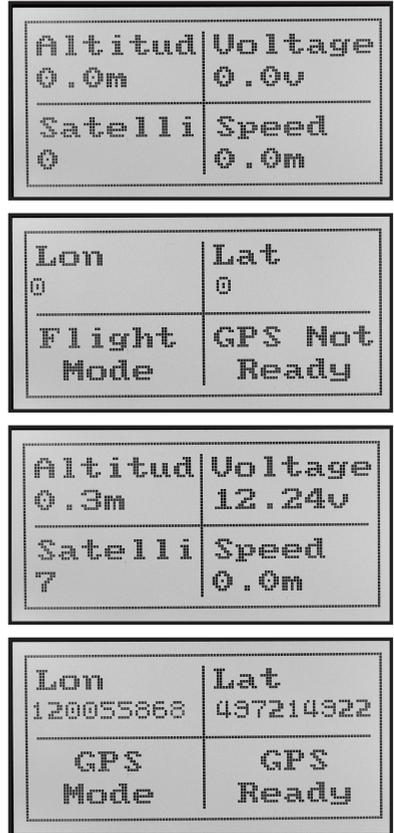


Figure 12



If the power supply is not sufficient for correct transmitter operation anymore, the battery icon will flash at a voltage of less than 4.2 V and the transmitter emits acoustic warning sounds at regular intervals. The model should then no longer be operated.

When the voltage drops below 4.0 V, the transmitter emits alarm sounds without interruption. In this case, operation of the model must be ceased as quickly as possible. Insert new batteries for further operation of the transmitter.

### c) Setting the Control Stick 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.

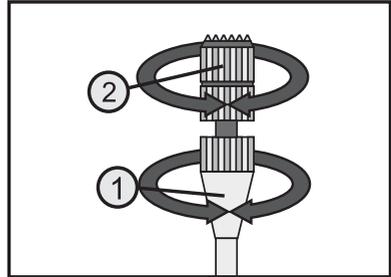


Figure 13

## 11. Commissioning of the Quadcopter



Before you start the quadcopter for the first time, read this section with care. Only if you are absolutely certain that you have made all settings correctly must you start the motors and let the quadcopter lift off.

Otherwise, contact an experienced model pilot who can support you in initial commissioning. We recommend using a flight simulator where you can train your first flight tasks without danger.

### a) Checking Activation/Deactivation function of the Flight Battery

Before inserting the flight battery in the quadcopter, check the activation/deactivation function of the electronics in the flight battery.

#### Switching on

To switch on the flight battery, briefly push the on/off button (1) at the flight battery and release it again at once. When the flight battery is fully charged, the four LEDs of the flight battery will start to light up.

Now push the on/off button (1) again and keep it pushed. The four LEDs will go out and start to light up again in sequence (LED 1 to LED 4).

When all four LEDs are lit, release the button again. The flight battery is now on and voltage is pending on the rechargeable battery contacts.

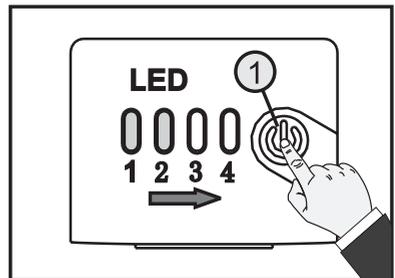


Figure 14

#### Switching Off

Briefly push the on/off button (1) at the flight battery with the flight battery switched on and release it again at once. The four LEDs of the flight battery will start to flash three times.

During this time, push the on/off button (1) again and keep it pushed. The four LEDs will be lit and then go out in sequence (LED 4 to LED 1).

When LED 1 has gone dark as well, release the button again. The flight battery is now off and the battery contacts are powered down.

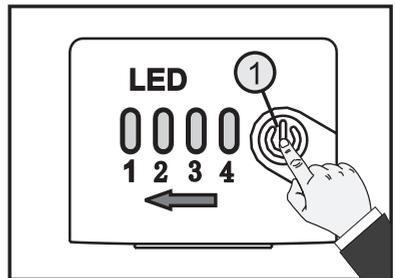


Figure 15

## b) Inserting the Flight Battery into the Quadcopter

To ensure a sufficiently good satellite reception, the quadcopter should be set up on a free field, where no high-voltage lines, power masts, metal constructions or other obstacles may impair GPS reception.

Stay away from broadcasting systems and other facilities that may negatively influence the electromagnetic conditions in your environment.

The flight field should also be free of obstacles such as buildings or trees to ensure unimpaired flight operation.

Choose a day with good weather and the least possible wind.

Before inserting the flight battery in the quadcopter, check the voltage situation. For this, briefly push the on/off button (1) at the flight battery. All four LEDs must be lit for two seconds.

Switch on the remote control transmitter and check the correct function of the transmitter with the display. The trimming displays (see figure 10, items 5, 6, 8 and 10) must be in the middle position. If this is not the case, the trimming must be set (see the following chapter 11. g).

Turn the rotating encoder „VRB“ to the centre position or check the centre position of the controller.

Now push the deactivated flight battery (see figure 16, item 1) into the quadcopter with the charge connection contacts first. Slightly push the grooved surface of the battery lock (see figure 16, item 2) so that the locking tab can latch and the flight battery is safely held in the quadcopter.

When the flight battery has been inserted into the quadcopter and is locked properly, switch on the flight battery with the on/off button (see figure 6, item 1), so that the quadcopter is supplied with power

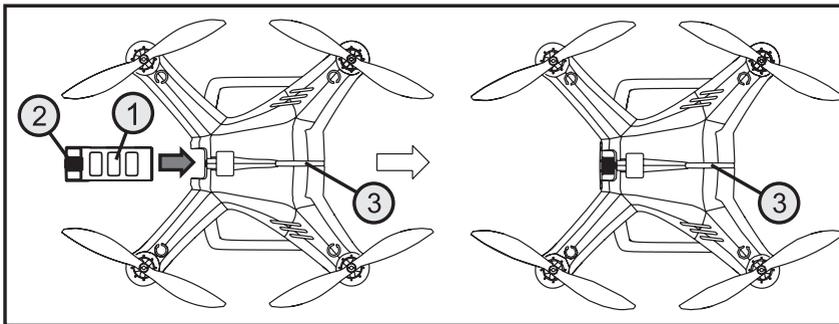


Figure 16

The status LEDs (see figure 16, item 3) light up yellow (red and green) and the quadcopter performs a self-test. After a brief time, the downward-pointing LEDs in the book arms will flash and the quadcopter will emit a brief signal.

The gimbal swivels the camera holder into the home position and the status LEDs will briefly go out and then start to flash. The meaning of the flashing impulses is described in more detail below.

When the binding between the transmitter and receiver is correct, the display of the remote control shows the voltage supply of the receiver (see figure 10, item 4). Push the buttons „UP“ or „DOWN“ at the transmitter to get more information about the current reception of the GPS satellite.

### c) Calibration of the Compass

The quadcopter has a compass with the help of which it can control the flight direction and flight altitude.

Before the quadcopter can be started, the compass must be calibrated. We recommend calibration before each flight.

After a site change to another starting position, the compass must be calibrated.

To calibrate the compass in the free field, proceed as follows:

- Switch the toggle switch „GPS“ 5 times quickly from the front position (position 1) to the rear position (position 2) and back. The status LEDs at the quadcopter must be permanently lit yellow (red and green).
- Hold the quadcopter horizontally (see figure 17, illustration A) and turn it around its vertical axis until the status LEDs switch to green (at least 360°).
- Then hold the quadcopter with the front propellers vertically down and turn it 360° around the longitudinal axis (see figure 17, illustration B), until the status LEDs go out.
- Calibration is complete.
- Return the quadcopter to the normal position.
- After a brief time, the status LEDs will flash according to the GPS satellites received.
- If the status LEDs flash red and yellow, calibration was defective and must be repeated.

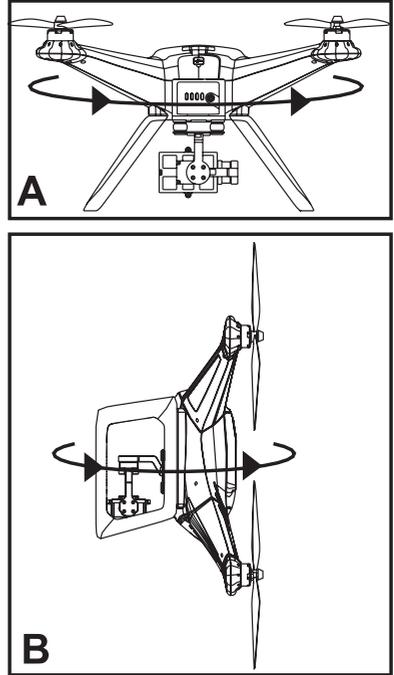


Figure 17

## d) Basic Information Relevant to the Control of Quadcopters

Before you let your model lift off for the first time, you should first familiarise yourself with the control possibilities open to you and thereby be able to fly safely.

The quadcopter is controlled via the two control sticks at the remote control transmitter. Ex works, the control functions of the two sticks are programmed to „mode 2“.

If you want different control stick assignments, you can adjust them at any time. For further information on the control stick assignment, see the chapter „Programming the Remote Control Transmitter“.

Control stick assignment „Mode 2“ offers the following functions:

### Pitch Function

With the pitch function you can control the flight altitude of the quadcopter (see figure 18). The left control stick (also see figure 7, item 16) is used for control. In contrast to other remote control systems, where the control stick for the pitch function can be moved forward and back without springing back to the middle position, the pitch control stick has a middle position in the quadcopter „Shadow“ in which it is held by spring force.

If the control stick for the pitch function is moved from the middle position upwards, the quadcopter will climb. If it is deflected from the middle position downwards, the quadcopter will sink.

Every time the control stick is returned to the middle position, the remote control will emit a signal sound.

Once the control stick is in the middle position, the propeller speeds should be high enough for the quadcopter to hover.

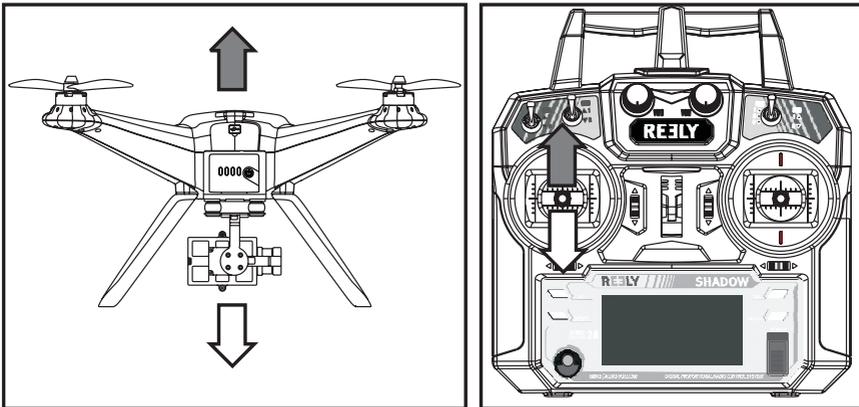


Figure 18

## Yaw Function

The two right-ward turning and the two left-ward turning propellers balance out the torques acting on the model. The quadcopter hovers stably.

If the control stick for the yaw function (also see figure 7, item 16) is moved to the left, the electronics in the model will increase the speed of the propeller turning to the right (clockwise) and at the same time reduce the speed of the propellers turning to the left (counter-clockwise). This way, the entire lift force remains the same, but only one torque acts on the model, which turns the quadcopter around its vertical axis to the left (see figure 19).

If the control stick is moved to the right, the speed changes of the propellers are precisely the other way around and the model turns to the right.

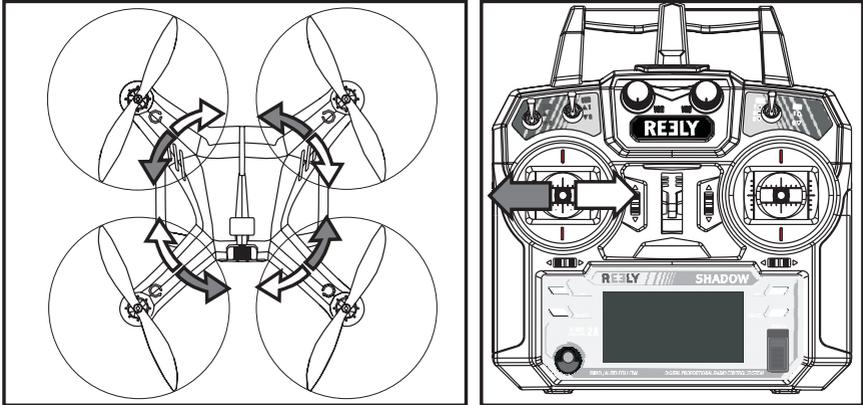


Figure 19

**Roll function**

The roll function allows you to move your quadcopter sideways to the right and to the left (see figure 20). Use the right control stick for control (also see figure 7, item 6).

If the stick is slightly moved to the left, the electronics in the quadcopter change the propeller speeds so that the model will turn to the left slightly and thus also fly to the left.

If you move the transmitter to the right, the speed changes of the propellers are precisely inverted and the model will fly sideways to the right.

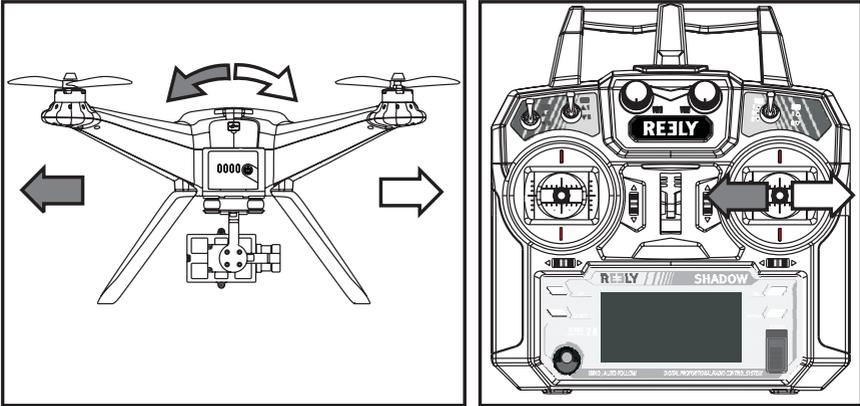


Figure 20

## Nod Function

The nod function allows you to move your quadcopter forward and backward (see figure 21). This is also controlled with the right control stick (also see figure 7, item 6).

If the stick is slightly pushed to the front, the electronics in the quadcopter change the propeller speeds so that the model will turn to the front slightly and thus also fly forward.

If you move the transmitter to the rear, the speed changes of the propellers are precisely inverted and the model will fly to the rear.

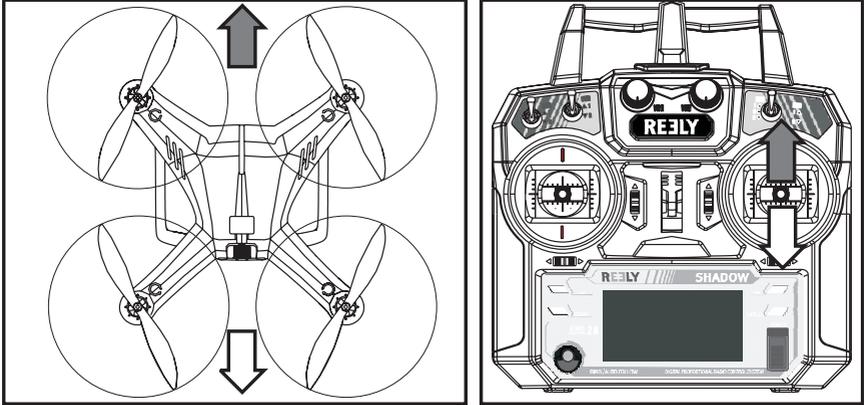


Figure 21

## e) Setting the Toggle Switch

Before letting your model lift off for the first time, check the switch positions of the three toggle switches „IOC“ (also see figure 7, item 18), „GO-HOME“ (see figure 7, item 19) and „GPS“ (also see figure 7, item 4).

The switches must be in the front or upper position according to the drawing in figure 22.

In this switch combination, the quadcopter flies GPS-stabilised. This switch position is ideal for the first test flights outdoors.

If the quadcopter is to be used indoors (e.g. in a hall or apartment, etc.), the switch „GPS“ must be put in the bottom position „GPS“ off).

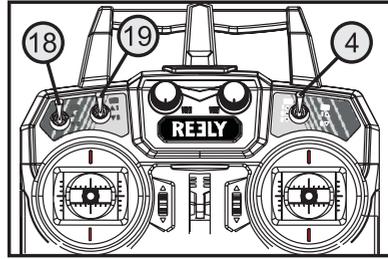


Figure 22



Since operation indoors does not have GPS support, beginners and inexperienced model pilots should initially only operate the quadcopter outdoors and with GPS support.

For more information on this, see the following chapter 12.

The switches have the following functions:

	Switch position front/top	Switch position Middle	Switch position rear/bottom
Switch „IOC“	„IOC“ off	„POI-Mode“	„Home Lock-Mode“
Switch „GO-HOME“	„Go-Home“ off	-	„Go-Home“ on
Switch „GPS“	„GPS“ on	-	„GPS“ off



For a precise description of the individual functions, see chapters 12 to 14.

## f) Starting the Quadrocopter

- Stand behind the quadrocopter.
- The quadrocopter should point at you with the voltage display of the flight battery (four LEDs).
- Check the voltage display of the flight battery and the remote control transmitter, as well as the position of the toggle switches (position front/top).
- Wait until the quadrocopter receives more than six GPS satellites and has saved the starting point. The status LEDs will then flash green approx. every 5 seconds. Now your quadrocopter is ready to start.
- Move the left control stick to the lower right and at the same time the right control stick to the lower left (see figure 23).
- Once the motors start up, return both control sticks to the middle position again without delay.
- The LEDs pointing down on the front boom arms are white and the LEDs pointing down on the rear boom arms are red.

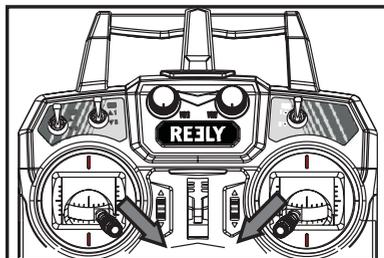


Figure 23



### Important!

Never move both control levers at once to start the motors while the quadrocopter is hovering or standing on the ground with the motor running. The quadrocopter would crash with standing propellers or tip backwards on the ground and take damage.

- Push the control stick for the pitch function slowly to the front. The quadrocopter increases the propeller speed and lifts off.
- When you return the control stick to the middle position, the quadrocopter will hover.



### Important:

Do not deflect the control stick for the pitch function too much; otherwise, the quadrocopter will rise very quickly or drop too quickly.

Never try grabbing the flying quadrocopter with your hand. There is a considerable danger of injury.

- Perform the first careful direction controls at an altitude of 1 - 2 m and observe how the quadrocopter reacts to the control commands.
- To land the quadrocopter again, pull the control stick for the pitch function from the middle position back a bit for the quadrocopter to slowly reduce flight altitude and land.
- When the quadrocopter has touched down, pull the control lever for the „pitch“ function all the way to your body and keep it in this position. Once the motors have been switched off and the propellers are no longer turning, put the control lever back into the middle position.



### Attention!

Always keep an eye on the 4 LEDs of the voltage indication of the flight battery while flying. With increasing flight length, LED 4 will start flashing first and then go out. This repeats with LED 3 and LED 2.

At the latest when only LED 1 is lit anymore you should start landing without delay. If this is not done, the quadrocopter will initiate a landing on its own to avoid harmful deep discharge of the flight battery. The status LEDs at the quadrocopter start to flash red.

As an alternative to the rechargeable battery LEDs, which offer only a general indication in the end, you can read the current voltage of the flight battery much more precisely in the transmitter display.

## g) Trimming the Quadcopter

When operating the quadcopter indoors (e.g. in a hall) or in manual mode („GPS“ off), the quadcopter may fly into a specific direction in spite of both control sticks being in the middle positions.

If the quadcopter drifts to the right when hovering, push the trim button for the roll function (also see figure 7, item 7) to the left until the quadcopter stops trying to drift to the right.

The remote control emits a short signal sound for each press of a trim stick. The tone height depends on the trimming direction. The middle position is acoustically indicated by a longer signal.

The set value is automatically saved and is retained even after switching the transmitter off and on.

The other three control functions can be set with the trim buttons (see figure 24, items 5, 15 and 17) according to the same scheme as required.

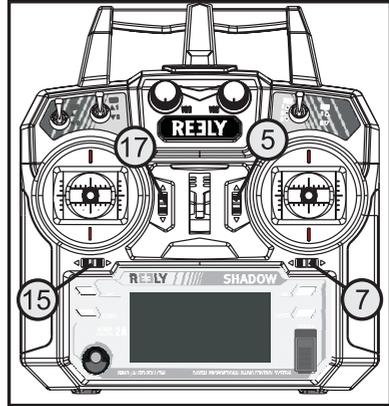


Figure 24

## h) Overview of the Flashing Displays of the Status LEDs

After switching on the transmitter and the flight battery in the quadcopter, the quadcopter will perform a self-test in which it checks, among others, binding with the transmitter. During this time, the status LEDs will light up yellow\*. Do not move the quadcopter during this period.

If the self-test of binding with the transmitter was defective, the status LEDs will flash green slowly.

If the self-test or binding with the transmitter was successful, the following displays of the status LEDs depending on the position of the switch „GPS“.

In „manual mode“ (the switch „GPS“ is in the rear/bottom position), the status LEDs flash yellow\* once and red 4 x after two seconds. This flashing rhythm repeats continually.

In „GPS mode“ (the switch „GPS“ is in the top/front position), the status LEDs flash yellow once and red several times after two seconds. When 4 or more GPS satellites are received, the status LEDs flash green and red.

The number of red flashing impulses shows the number of satellites received:

4 red flashing impulses: Insufficient GPS reception (flight not possible in „GPS mode“).

3 red flashing impulses: 4 GPS satellites received.

2 red flashing impulses: 5 GPS satellites received.

1 red flashing impulse: 6 GPS satellites received.

No red flashing impulses: 7 or less GPS satellites are received. The LED display flashes only green every 5 seconds.



The more satellites are received, the more precise will the automatic positioning of the quadcopter in flight be.

- The quadcopter has a fixed warning threshold that protects the flight battery from deep discharge. If the voltage of the flight battery drops below the warning threshold, the quadcopter will land on its own and the status LEDs will flash red quickly.
- When the quadcopter no longer receives any remote control signal, the status LEDs will flash green quickly.
- When the quadcopter is in a flight prohibition zone, the status LEDs will flash 10 x with a subsequent pause of 2 seconds. This flashing scheme is repeated continually.
- When the quadcopter is in an electromagnetically complex environment with interference signals, the status LEDs remain lit red.
- When the quadcopter has successfully saved the flight alignment, the status LEDs flash green quickly 20 x.
- When the quadcopter has successfully saved the starting point, the status LEDs flash red quickly 20 x.
- When the quadcopter has successfully saved the point of interest, the status LEDs flash yellow\* quickly 20 x.

\* To display the colour yellow, the red and green LEDs of the status display will light up together. Since the LEDs are not placed very closely together, the yellow light effect is not quite as well recognisable as the red or green display.

## 12. Overview of the Flight Modes

The quadcopter has different flight modes that can be activated by toggle switch.

### a) „Manual-Mode“

„Manual-Mode“ is suitable for indoor shows where it is not possible to receive a GPS signal for constructional reasons. The quadcopter can be controlled in all directions but there are no automatic corrections of the light position, since the quadcopter has no GPS information.

### b) „GPS-Mode“

The „GPS-Mode“ is ideal for the first flight attempts outdoors, where best GPS reception is possible. The quadcopter can be steered in all directions, and the flight position is corrected automatically. This means: The quadcopter will automatically maintain the last position/altitude when the control sticks at the transmitter are in their middle positions. In „GPS mode“, the „IOC“ function („Intelligent Orientation Control“) can be activated.

### c) „IOC“ Function (Smart Flight Orientation)

Without „IOC“ function (= „Intelligent Orientation Control“), the movement directions always refer to the build of the quadcopter. The side with the status LEDs is front. Looking at the quadcopter from above, e.g. a control command forward will always move it in the direction in which its front is aligned (no matter which direction the front of the quadcopter is currently pointing in).

This may lead to problems when the quadcopter, e.g. points to the pilot with its front (status LEDs). Now the quadcopter will move in the opposite direction of the one the pilot steers it in at the transmitter from his point of view.

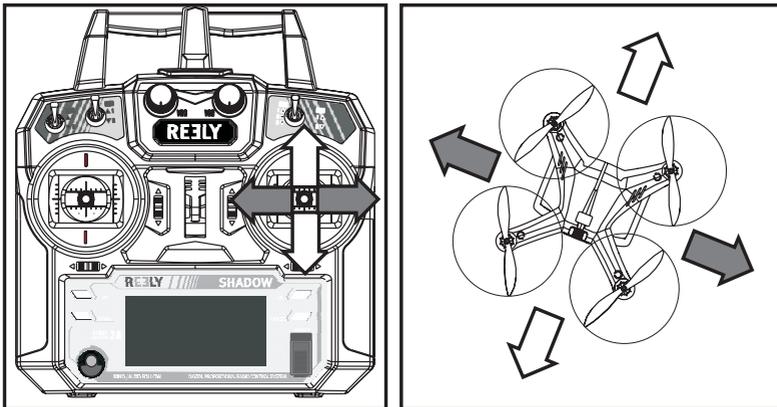


Figure 25

When the „IOC“ function has been activated, the movement directions of the quadcopter no longer refer to its build. The movement direction of the quadcopter changes depending on which mode is called within the „IOC“ function.



**Important!**

The „IOC“ function requires concurrent reception of more than 6 GPS satellites and the quadcopter must be more than 5 m away from the starting point. Then, a total of three modes are available:

- „CL Mode“ (= „Course Lock“)
- „HL-Mode“ (= „Home Point Lock“)
- „POI-Mode“ (= „Point Of Interest“)

**Attention!**

When the quadcopter is in „IOC-Mode“ and flies farther away, do not push the „IOC“ switch repeatedly since this will overwrite saved values and, e.g. the „return home“ point will be in an entirely different location (also see chapter 13).

**d) „CL-Mode“**

In „CL-Mode“ (= „Course Lock“), the quadcopter uses its installed compass to measure its alignment. When the quadcopter has been aligned e.g. with a far-distance church tower with its front before the start, it will always fly towards the church tower when steering forward at the transmitter. This applies even if the quadcopter has been turned around during the flight and its front points in any other direction.

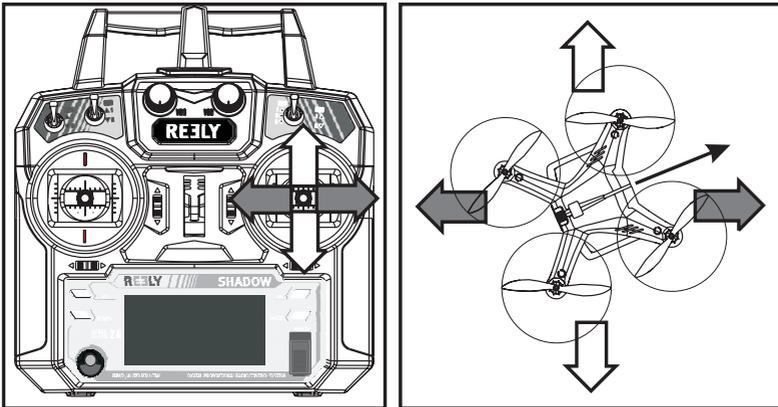


Figure 26

### e) „HL-Mode“

In „HL-Mode“ (= „Home Point-Lock“), the movement direction of the quadcopter always refers to the line from the starting point (HP) in the direct proximity of which the pilot is placed as well, and the quadcopter. Independently of the direction in which the front of the quadcopter is aligned, it will always fly in the direction in which the pilot steers at the transmitter from the pilot's point of view. This mode has a safe distance of at least 5 m from the starting point in which the „HL mode“ cannot be activated or that the quadcopter maintains automatically when flying.

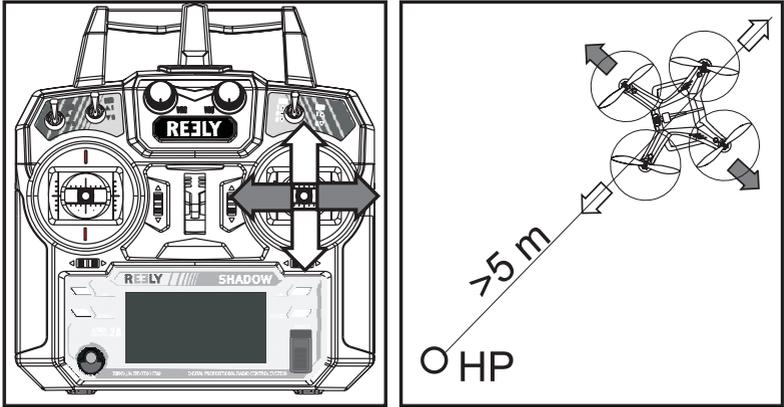


Figure 27

### f) „POI-Mode“

In „POI-Mode“ (= „Point Of Interest“), the movement direction of the quadcopter refers to a freely selectable point in the terrain with which the quadcopter is aligned with its front. By steering to the right and left, you can choose the direction and speed in which the quadcopter circles around the point in the terrain. Steering forward (closer to the „POI“) and backward (farther away from the „POI“) influences the radius of the flight track. The possible radius around the „POI“ is 5 - 500 m.

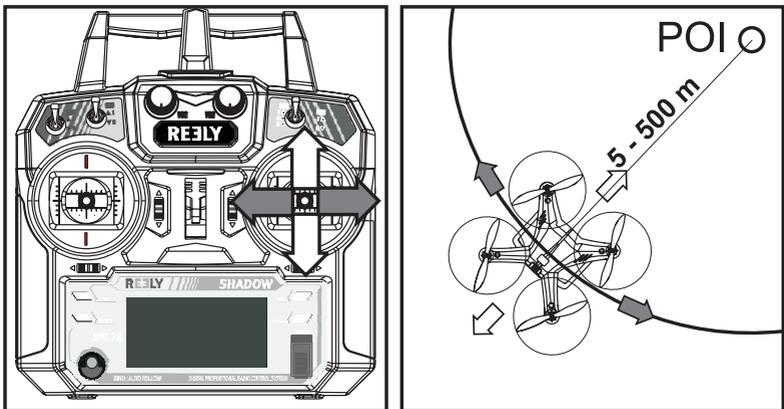


Figure 28

## 13. Activating the Flight Modes

The „IOC“ function is activated and deactivated with the „IOC“ switch, which also switches the respective flight modes. The switch can be assigned with 3 combination options on demand. Ex works, the switch „IOC“ is occupied according to the combination C in the following table.

Switch „IOC“	Switch position front/top	Switch position Middle	Switch position rear/bottom
Combination A	„IOC“ off	„CL-Mode“	„HL-Mode“
Combination B	„IOC“ off	„CL-Mode“	„POI-Mode“
Combination C	„IOC“ off	„POI-Mode“	„HL-Mode“

If you want to use „CL-Mode“, the quadcopter must be reprogrammed to the switch combination A or combination B.

The assistance software needed for this is available for download free of charge online on the respective product page of [www.conrad.com](http://www.conrad.com). The interface cable for connection of the quadcopter to the computer is already enclosed with the quadcopter.

For the quadcopter to be able to activate the different „IOC“ modes, it must record and save the alignment, the „home point“ or the „point of interest“. This is partially done automatically or can be performed manually.

### „CL-Mode“

The mode is only available if the switch „IOC“ has been reprogrammed to the combination A or B.

The alignment of the quadcopter is automatically recognised 36 seconds after plugging in of the flight battery. More than 6 GPS satellites must be received.

To manually save the alignment, the switch „IOC“ must be switched back and forth between the front/upper and the middle position 3 - 5 times.

When the alignment has been saved successfully, the status LEDs flash green quickly 20 x.

### „HL-Mode“

The mode is only available if the switch „IOC“ has been programmed to the combination A or C.

The point where the control stick for the pitch function has been pushed forward for the first time and the quadcopter lifted off is saved as the starting point automatically.

The prerequisite for this is reception of more than 6 satellites for a period of at least 10 seconds.

To manually save another starting point, the switch „IOC“ must be switched back and forth between the middle and the rear/lower positions 3 - 5 times.

When the starting point has been saved successfully, the status LEDs flash red quickly 20 x.

## „POI-Mode“

The mode is only available if the switch „IOC“ has been programmed to the combination B or C.

The „point of interest“ can only be saved manually. The prerequisite for this is reception of more than 6 satellites for a period of at least 10 seconds.

To manually save the „point of interest“, the switch „IOC“ must be switched back and forth between the front/upper and the middle position in combination C 3 - 5 times.

In combination B, the switch „IOC“ must be switched back and forth between the middle and the rear/lower positions 3 - 5 times.

When the „point of interest“ has been saved successfully, the status LEDs flash yellow quickly 20 x.

## 14. „Go-Home“ Function

The quadcopter has a „Go-Home“ function that returns the quadcopter to the starting point automatically or by remote control command. The prerequisite for this function is that the starting point has been saved (see „HL-Mode“) and that the quadcopter is flying in „GPS-Mode“ and receives more than 6 GPS satellites. The distance between the quadcopter and the saved starting point must be more than 5 m as well.

When the switch „Go Home“ is put in the rear/lower position for the return function, the quadcopter will turn more or less and hover for approx. 3 seconds.

When the quadcopter is below a flight altitude of 20 m, it will first climb to 20 m before flying back over the saved starting point. If it is at a flight altitude above 20 m, it will return to the starting point at once.

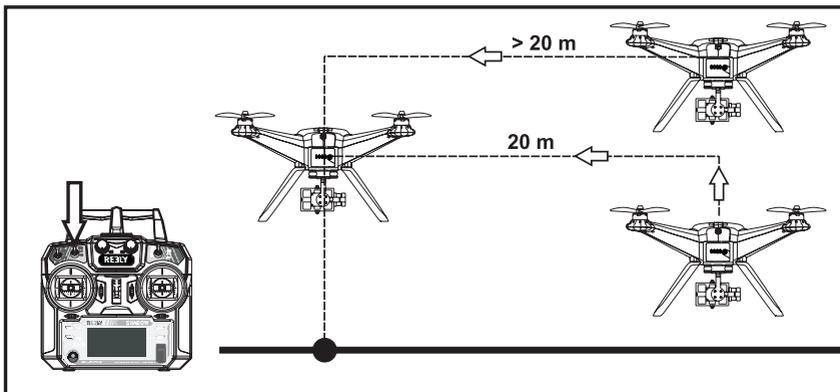


Figure 29

When it is above the saved starting point, it will quickly reduce the flight altitude to 5 mm and hover for 3 - 5 seconds before finally slowly reducing the remaining flight altitude until touching down.

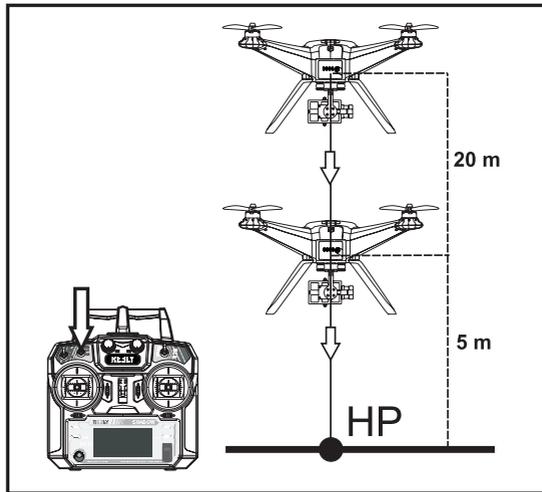


Figure 30



**Attention!**

The „Go-Home“ function is tripped automatically when the quadcopter no longer receives any valid remote control signal. With the assistant software, which is available as a free download in the Conrad-Shop with the product, you can set if the quadcopter is to perform the „go-home“ function or hover in place when it loses contact.

**Important:**

When the quadcopter receives fewer than 6 satellites or is not in „GPS-Mode“, the „Go-Home“ function is no longer available.

If the quadcopter is in a difficult to control situation or very far away from the pilot's site, activate the return function with the „Go-Home“ switch. Never switch off the transmitter.

Observe obstacles that may be in the way during the automatic return flight. The quadcopter does not have any automatic obstacle recognition.

When the quadcopter has landed, switch off the drive motors.

## 15. „Following“ Function

For the quadcopter to be able to follow the remote control, the transmitter also must be equipped with a GPS receiver (see figure 31, item 1). The installation of the GPS receiver on the remote control can be taken from the above illustration in figure 31.

The connection plug (see figure 31, item 2) of the GPS receiver is connected to the rear of the remote control.

If the transmitter with the connected GPS receiver is switched on, the satellite display at the left of the display flashes (see figure 10, item 7). If more than 7 satellites are received, the display remains lit.

Then take the quadcopter into operation, calibrate the compass and then switch it to „GPS-Mode“.

Start the quadcopter and fly it to the desired position in which it is to follow the remote control transmitter.

When the quadcopter is in the desired position, push the button „BIND/AUTO FOLLOW“ (3). The quadcopter will now align with the transmitter and follow any movement of the transmitter in the same altitude and at the same distance.

To end the following function, push the button „BIND/AUTO FOLLOW“ again and land the quadcopter.

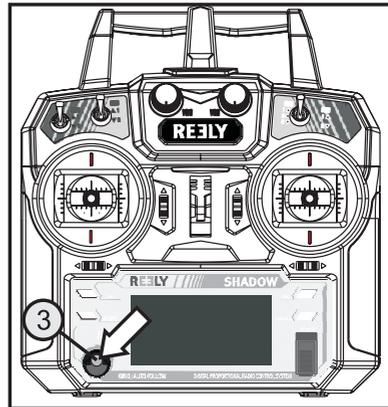
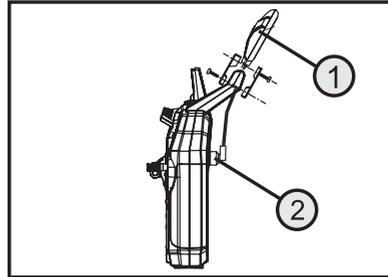


Figure 31



### Caution, important!

The quadcopter cannot recognise obstacles. It will always maintain the same distance and altitude as compared to the transmitter. It does this even if there are, e.g., trees or other obstacles in the way. Observe this when working in „following mode“.

## 16. Undervoltage Warning

The quadcopter checks the voltage of the flight battery continually in flight. The current voltage can be read in the remote control's display if required (see upper illustration in figure 12). However, the voltage values are displayed with a delay due to the data transmission.

If the voltage drops below the fixed value set ex works, the status LEDs at the quadcopter will flash red quickly and the quadcopter will land automatically. The remote control will emit continuous warning sounds and the display will show a flashing warning message. To switch off the warning messages, you need to switch the transmitter off and on again after switching the quadcopter off.



Even if the flight direction can still be controlled within limits during independent landing, we recommend not to fly this long. Observe the voltage display at the flight battery and the transmitter and land in time.

## 17. Failsafe Function

The failsafe function protects the quadcopter from crashing when it receives no valid remote control signal anymore. In the assistant software, you can set how the quadcopter is to behave if the transmitter signal fails. The automatic flight control system in the quadcopter can let it hover in place or return to the starting point and land there.

The failsafe function will, however, only work when GPS data are available. Otherwise, the quadcopter can only try to stabilise the flight position and to maintain the altitude.

For more information on the failsafe function, see the assistant software.

## 18. Flight Space Limitation and Flight Prohibition Zones

The quadcopter has a distance and altitude limitation that can be set individually with the assistant software. Ex works, a maximum flight altitude of 120 m and a max. distance of 300 m are set.

If the distance limit is exceeded by more than 10 m, the quadcopter will automatically return to the starting point. Compliance with the max. distances only works, however, if the quadcopter is operated in „GPS-Mode“ and has enough satellite reception.

The quadcopter also considers flight prohibition zones. Flight prohibition zones are areas in direct proximity to airports, military systems and other protection-worthy facilities. The quadcopter has a digital map in which these zones are shown. In connection with its intelligent orientation function, the quadcopter can tell when it enters a flight prohibition zone if in „GPS-Mmode“. In this case, the status LEDs will flash red 10 x.

If the flight prohibition zone has been entered, the quadcopter will no longer react to the flight altitude control. The other control functions are fully retained. The quadcopter reduces the flight altitude automatically with a dropping rate of approx. 3 m/s until it either lands automatically or is steered from the flight prohibition zone.



### **Attention!**

Compliance with flight prohibition zones can be switched off and on in the assistant software. We urgently recommend not switching off this function, however.

## 19. Gimbal Control

The camera holder that is stabilised around two axes (gimbal) compensates for the nod and roll movements of the quadcopter and thus ensures a calm camera image.

Additionally, the camera can be swivelled from the horizontal position vertically up by  $45^\circ$  and down by  $135^\circ$ . The swivel movement is controlled with the rotary controller VRB (1).

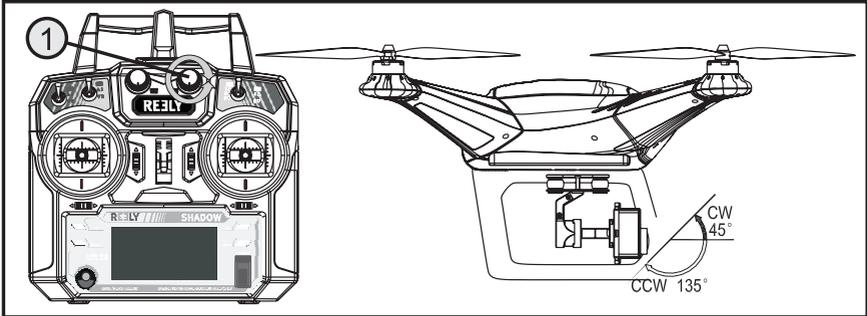


Figure 32



### Caution, important!

Never operate the camera holder without a camera inserted. The missing weight of the camera will cause the holder to be unbalanced, which will put too much of a strain on the controlling electronics, which may be damaged.

## 20. Binding Function

Transmitter and receiver in the quadcopter are already aligned with each other (bound) in the factory and can be used at once. Renewal of binding is only required after replacing the receiver in the model, when replacing the transmitter or to remove a malfunction, e.g. when the receiver parameters are no longer displayed in the transmitter display.



### Attention!

When the transmitter is reset to the factory settings, the binding must be renewed, since the receiver ID has also been deleted.

### Re-establishing the binding:

To recover binding between the transmitter and model, the four propellers must be removed and the top of the housing of the quadcopter must be screwed off. For this, the landing frame must be removed and the 20 screws at the bottom of the housing turned out.



The four screws below the motors do not need to be removed, since these screws only hold the motors.

- Transmitter and receiver must be in direct proximity (distance approx. 50 cm).
- Switch off the transmitter.
- Disconnect the two plug connectors (1) with which the quadcopter is connected to the receiver from the receiver.
- Connect the enclosed programming plug (2) to the „B/VCC“ connection of the receiver with the cable loop.
- The receiver must be supplied with power via a receiver battery that is connected to any output of the receiver (3). Ensure correct polarity. The minus connection (-) must be at the bottom.
- Switch on the receiver. The red LED in the receiver (4) starts to flash quickly.
- Push the button „BIND/FOLLOW“ (5) at the transmitter and keep it pushed.
- Switch on the transmitter with the on/off switch (6) with the binding button pushed. Then release the „BIND/FOLLOW“ button at the transmitter.
- The display briefly shows „RXBinding“ and, at correct binding, „RXBind OK“. Then the display switches to operating display.
- The red LED in the receiver remains lit and binding is completed. If the LED flashes red, binding was not successful and must be repeated.
- Switch off the receiver and then the transmitter.
- Remove the programming plug and connect the two plugs of the quadcopter to the receiver again.

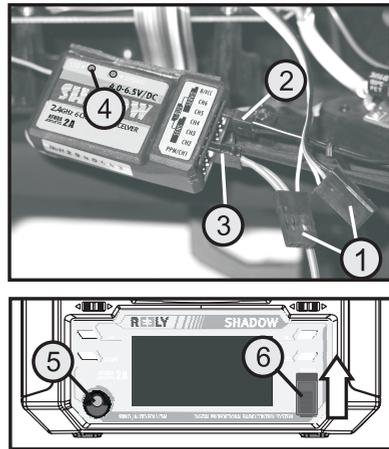


Figure 33

- Check the function of the system.



The receiver now must react to the control signals of the transmitter. If this is not the case, repeat binding or check the digital encoding of transmitter and receiver.

## 21. Programming the Remote Control

Your remote control offers a system setting menu „System setup“ and a function setting menu „Functions setup“ with different menu items in each. This way, you can make general settings or review functions at the transmitter.

The changes of the respective settings are made with the four programming buttons (also see figure 7, items 8, 9, 13 and 14). The settings are permanently saved and are retained even when changing the batteries.



Figure 34

**The functions of the operating elements:**

### „OK“ button

To call the programming menus, briefly push the button „OK“ with the transmitter on. The displayed operating display switches to the menu display and the transmitter switches to programming mode. This button can also activate selected settings. If the button is pushed or longer, the factory settings stored in the menu item are called.

### „CANCEL“ button

This button allows you to leave the currently selected menu or submenu again. Every brief push of this button takes you a step back until you reach the operational display. If the button is kept pushed for a while, the changed set values are stored.

### „UP“ and „DOWN“ buttons

The two buttons can be used to select the desired menu/submenu or change set values.



The transmitter emits a short signal sound for each permissible push of a button.

## 22. The System Setting Menu „System Setup“

The basic settings of the remote control transmitter are made in the system setup menu first.

To get to the system settings menu, push the button „OK“ with the transmitter switched on. The operating display in the display switches to the menu display. The selection window around the remote control icon shows that you can call the „System Setup“ menu in this setting.

Briefly push the button „OK“ again to get to the system settings menu.

The 5 menu items of the system setting menu are now displayed.

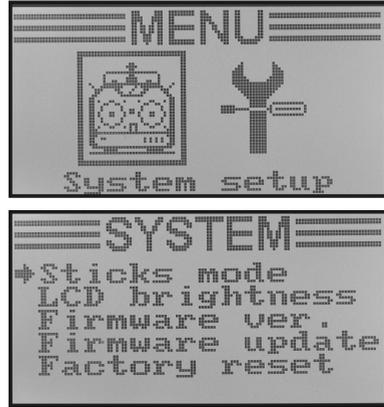


Figure 35

The following setting functions are available for you in the system setting menu:

Function	Display
Control stick assignment	„Sticks mode“
Display brightness	„LCD brightness“
Transmitter software version	„Firmware ver.“
Transmitter software update	„Firmware update“
Factory reset	„Factory reset“

### a) Control Stick Assignment „Sticks mode“

As already described in chapter „Commissioning of the Quadcopter“, the two control sticks are assigned specific control functions. The channels transmitted by the transmitter have the following functions:

CH1 = channel 1 (roll function)

CH2 = channel 2 (nod function)

CH3 = channel 3 (pitch function)

CH4 = channel 4 (yaw function)

When setting the control stick assignment (mode), you can exactly determine the control stick you want to use to control channels 1 - 4. Ex works, the remote control is configured to „mode 2“.

## Setting the Control stick Assignment

- Switch on the transmitter and call the system setting menu.
- The top menu item „Sticks mode” is marked by the cursor arrow.
- Briefly push the button „OK” to activate the menu item.

The display shows the currently used control stick assignment. The two circles with the lines offset by 90° are the two control sticks. Additionally, the control functions are displayed according to the control stick assignment.

- Pushing the buttons „UP” or „DOWN” permits setting the desired control stick assignment „Mode 1” to „Mode 4”.
- Keep the button „CANCEL” pushed for a longer period to save the settings. The display then shows the system setup menu again.
- Push the button „CANCEL” repeatedly until you get back to the operating display.

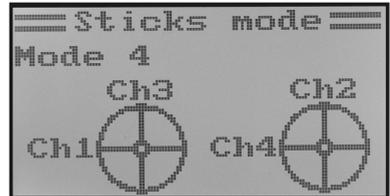
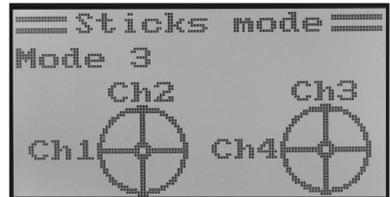
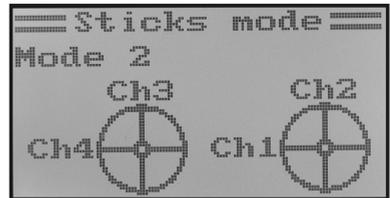
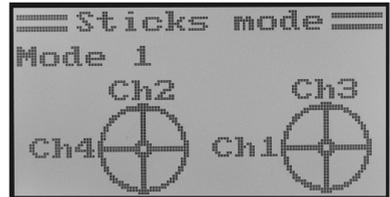
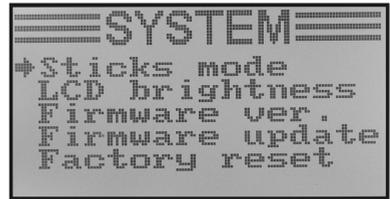


Figure 36

### Note:

Any change to the control stick assignment is only possible with the flight battery disconnected from the quadcopter.

If the quadcopter is in operation, the error message that the receiver must be taken out of operation will be displayed.



Figure 37

## b) Display Brightness „LCD brightness“

To have a perfectly legible display signals at all times, you can set the brightness value individually.

### Setting the brightness value

- Switch on the transmitter and call the system setting menu.
- Move the cursor arrow to the menu item „LCD brightness“ with the two buttons „UP“ and „DOWN“.
- Briefly push the button „OK“ to activate the menu item.

The currently set brightness value is displayed with a numeric value and a bar chart in the display. To better assess the brightness settings, the quadcopter is displayed as a model icon at the lower display edge of the display as well.

- Push the buttons „UP“ or „DOWN“ to select the desired display brightness now. If the button „OK“ is pushed and held, the factory parameters are called.
- Keep the button „CANCEL“ pushed for a longer period to save the settings. The display then shows the system setup menu again.
- Push the button „CANCEL“ repeatedly until you get back to the operating display.

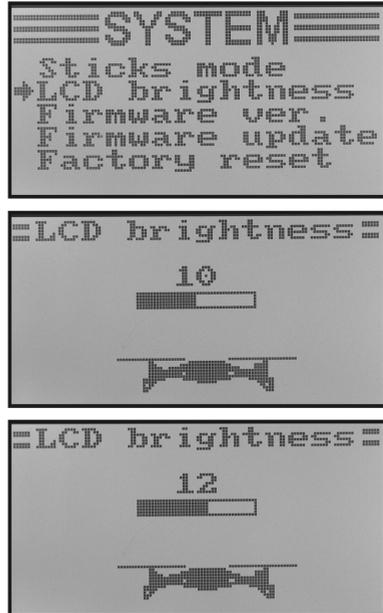


Figure 38

### c) Transmitter Software Version „Firmware ver.“

On demand, you can have the version number and the date of the transmitter software displayed. This way, you can recognise at once whether there is a newer software for the transmitter that can be installed (see following menu item).

#### Display of the Transmitter Software Version

- Switch on the transmitter and call the system setting menu.
- Move the cursor arrow to the menu item „Firmware ver.“ with the two buttons „UP“ and „DOWN“.
- Briefly push the button „OK“ to activate the menu item.

The transmitter designation, software version and date of the transmitter software are displayed in the display.

- Push the button „CANCEL“ repeatedly until you get back to the operating display.

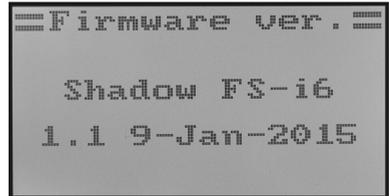
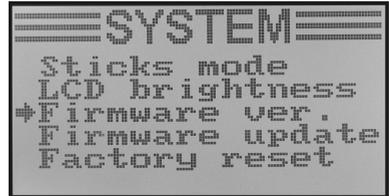


Figure 39

## d) Transmitter Software Update „Firmware update“

To transfer a newer version of the transmitter software to the remote control, the transmitter must be connected to a PC or notebook with a USB interface cable. For the data to be transmitted to the remote control, the transmitter must be put in the update mode. No receiver that belongs to the transmitter must be activated during this process.

### Activate transmitter software update

- Switch on the transmitter and call the system setting menu.
- Move the cursor arrow to the menu item „Firmware update“ with the two buttons „UP“ and „DOWN“.
- Briefly push the button „OK“ to activate the menu item.

The display shows a message that the transmitter is switched to the update mode and all functions are stopped. You are asked to push the button „OK“ to activate the update function.

- After pushing the button „OK“, a safety prompt appears.
- Pushing the buttons „UP“ or „DOWN“ switches the cursor arrow from „No“ to „Yes“. Push the button „OK“ again to activate the update function.

The push of the button is in this case not confirmed with a sound but the display lighting is darkened. The display shows that the update function is active. The data transmission can now be started at the computer. All buttons at the remote control are out of order during the transmitter software update.

- Switch the transmitter off and on again after the data transmission is completed.

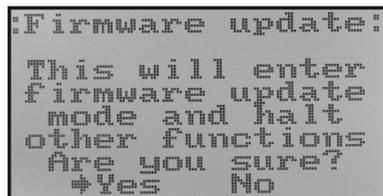
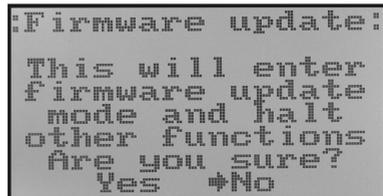
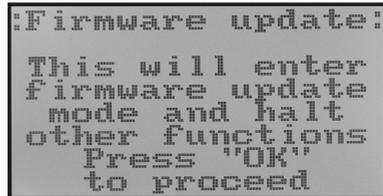
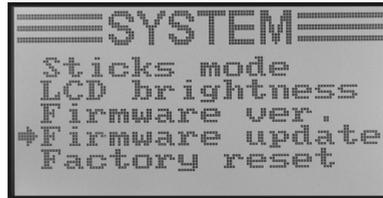


Figure 40



### Important!

Since the remote control was already equipped with the latest transmitter software ex works, a software update is usually not required.

## e) Reset to Factory Settings „Factory reset“

With this function you have the option of deleting all the data of all remote control to their factory settings with a single command.



### Attention!

When you call this function, all previously entered settings are deleted! The remote control is returned to the delivery condition and all individual data must be entered again.

Binding between the transmitter and receiver is lost! Binding must be performed and the quadcopter must be screwed open for this. Therefore, perform this action only if absolutely necessary.

### Factory reset

- Switch on the transmitter and call the system setting menu.
- Move the cursor arrow to the menu item „Factory reset“ with the two buttons „UP“ and „DOWN“.
- Briefly push the button „OK“ to activate the menu item.

The display shows the message that the transmitter deletes all entered settings when resetting to factory settings. You are asked to push the button „OK“ to activate the reset function.

- After pushing the button „OK“, a safety prompt appears.
- Pushing the buttons „UP“ or „DOWN“ switches the cursor arrow from „No“ to „Yes“. Push the button „OK“ again to activate the reset function. The display shows the system setup menu again after a moment.
- Push the button „CANCEL“ repeatedly until you get back to the operating display.

```
=====SYSTEM=====
Sticks mode
LCD brightness
Firmware ver.
Firmware update
+Factory reset
```

```
==Factory reset==
This will reset
all parameters
to their
factory default
Press "OK"
to proceed
```

```
==Factory reset==
This will reset
all parameters
to their
factory default
Are you sure?
Yes +No
```

```
==Factory reset==
This will reset
all parameters
to their
factory default
Are you sure?
+Yes No
```

Figure 41

## 23. The Function Setting Menu „Functions setup“

In the function setup menu, you can check the switching and control functions and set the basic trim.

To get to the function settings menu, push the button „OK“ and hold it with the transmitter switched on. The operating display in the display switches to the menu display. The selection window around the remote control icon shows that you can call the system setup menu in this setting.

Push the button „UP“ or „DOWN“ so that the selection window frames the tools.

Briefly push the button „OK“ to get to the function settings menu.

The two menu items of the function setup menu are now displayed.

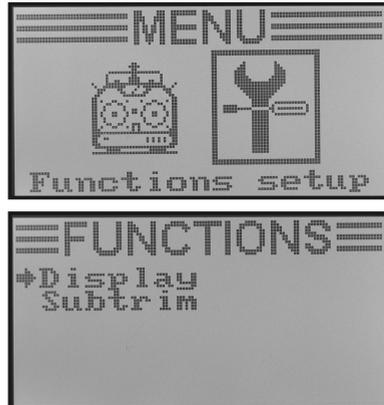


Figure 42

The following setting functions are available for you in the function setting menu:

Function	Display
Control encoder test	„Display“
Basic trim	„Subtrim“

## a) Control Encoder Test „Display“

In this menu, you can have the control signals of all 10 channels displayed graphically. When actuating the control sticks, switches or dial switches, you can check the changes of the control value at the same time in the bar chart. This shows you immediately if, e.g., a switch or potentiometer at the remote control is defective.

### Test control encoder

- Switch on the transmitter and call the function setting menu.
- The top menu item „Display“ is marked by the cursor arrow.
- Briefly push the button „OK“ to activate the menu item.

The display shows the first 6 channels in the current position of the encoders.

- If you move the control sticks or switches in different directions now, you will see precisely which channel is controlled in which direction.
- By pushing the buttons „UP“ and „DOWN“, you can switch the display to channels 7 – 10 and test the dial switches „VRA“ and „VRB“ there.
- Push the button „CANCEL“ repeatedly until you get back to the operating display.

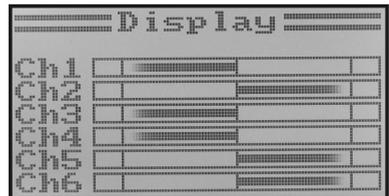
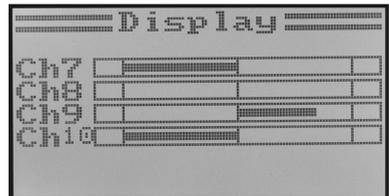


Figure 43



Since the remote control only has 9 control encoder functions, channel 10 is not controlled by the transmitter.

If you push the button „CANCEL“ when testing the control functions, the servo test is started. The 10 bar displays now continually run from one end stop to the other. Since the quadcopter is not controlled by servos, however, the servo test is not relevant for this model.

## b) Basic Trim „Subtrim“

As already mentioned when trimming in the quadcopter, it may happen in manual mode („GPS“ off) that the quadcopter will fly in a specific direction even though both control sticks are in the middle positions. The four trim buttons (see figure 7, items 5, 7, 15 and 17) can be used to trim the quadcopter so that it has a stable hover flight again when the control sticks are not deflected.

The basic trim can be used to pre-trim the quadcopter so that the quadcopter hovers stably again while the trim displays (see figure 10, items 5, 6, 8 and 10) are back in the middle positions.



### Important!

Before setting the basic trim, check with the operating display whether the four trim displays are set centrally.

### Setting the Basic Trim

- Switch on the transmitter and call the function setting menu.
- Move the cursor arrow to the menu item „Subtrim“ with the two buttons „UP“ and „DOWN“.
- Briefly push the button „OK“ to activate the menu item.

In the display you will see display items for the six control functions with the respective currently set trim values.

- Push the buttons „UP“ or „DOWN“ to select the base trim for channel 1.
- Brief pushing of the button „OK“ will cause the cursor arrow to jump to channel 2. If the button „OK“ is pushed and held, the factory parameter will be called.
- Push the buttons „UP“ or „DOWN“ to select the base trim for channel 2.
- Repeat this process until you have set the desired basic trim in all ten channels.
- Keep the button „CANCEL“ pushed for a longer period to save the settings. The display then shows the function setup menu again.
- Push the button „CANCEL“ repeatedly until you get back to the operating display.

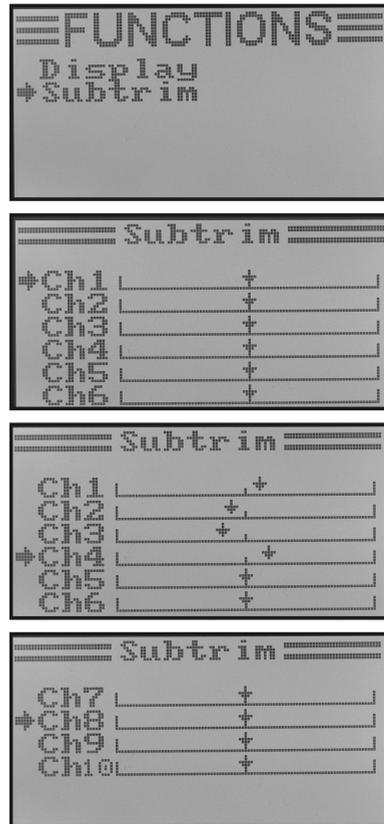


Figure 44

## 24. Maintenance and Care

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

The propellers have to be easily movable and there should not be a clearance in the bearing. Propellers that are torn or where small parts have broken off must be replaced with original propellers without delay in any case.

The spare parts list is located on our website [www.conrad.com](http://www.conrad.com) in the download section to the respective product.

Alternatively, you may also request the spare parts list on the phone. The contact information is included at the beginning of these operating instructions, chapter „Introduction“.

## 25. 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.

## 26. Troubleshooting

Even though the model and the remote control system were built to the state of the art, there may still be malfunctions 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"> <li>• Check the batteries in the transmitter.</li> <li>• Check the polarity of the batteries in the transmitter.</li> <li>• Check on/off switch.</li> </ul>
The remote control displays undervoltage after activation or after brief operation.	<ul style="list-style-type: none"> <li>• Exchange the batteries for new ones.</li> <li>• Use high-quality alkaline batteries.</li> </ul>
The remote control displays an error in the switch positions after switching on.	<ul style="list-style-type: none"> <li>• Move the switches to the front/top position after switching on.</li> </ul>
The camera holder (gimbal) is not horizontally aligned after activation.	<ul style="list-style-type: none"> <li>• Turn the dial switch „VRB“ to the middle position.</li> <li>• Check the plug connections of the camera holder.</li> </ul>
Motors cannot be started with the flight battery fully charged.	<ul style="list-style-type: none"> <li>• Control sticks are mechanically blocked and will not reach the end position in the respective inner/lower corner.</li> <li>• Middle position of the trim is misadjusted too far.</li> </ul>
Following function does not work.	<ul style="list-style-type: none"> <li>• Check the power supply of the quadcopter and the remote control.</li> <li>• The quadcopter does not receive at least 7 (or more) GPS satellites.</li> <li>• The remote control transmitter does not receive at least 7 (or more) GPS satellites.</li> <li>• The GPS receiver is not properly connected to the remote control transmitter.</li> <li>• The remote control transmitter requires 5 - 8 minutes after switching on until all possible satellites are received.</li> <li>• Push the button „BIND/AUTO FOLLOW“, to activate the following function.</li> </ul>
The quadcopter shows undervoltage.	<ul style="list-style-type: none"> <li>• Check the voltage situation of the flight battery. The voltage must be above 12 V.</li> </ul>
The quadcopter does not lift off or does not climb properly.	<ul style="list-style-type: none"> <li>• The quadcopter is in the flight prohibition zone.</li> <li>• The propellers are installed wrongly or swapped.</li> <li>• The wrong propellers are installed.</li> </ul>

The quadcopter cannot be switched to „IOC mode“.	<ul style="list-style-type: none"> <li>• Check the functions of the switches „IOC“ and „GPS“ in the remote control menu „Display“.</li> <li>• The quadcopter is not operated in „GPS mode“.</li> <li>• The quadcopter does not receive at least 7 (or more) GPS satellites.</li> </ul>
The quadcopter does not perform the „Coming Home“ function.	<ul style="list-style-type: none"> <li>• The quadcopter is not operated in „GPS mode“.</li> <li>• Check the functions of the switches „Go-Home“ and „GPS“ in the remote control menu „Display“.</li> <li>• The quadcopter does not receive at least 7 (or more) GPS satellites.</li> </ul>

## 27. 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](http://www.conrad.com).

## 28. Technical Data

### Transmitter:

- Frequency range .....2.4 GHz
- Number of channels .....10
- Digital encoding .....AFHDS2A (Automatic Frequency Hopping Digital System)
- Operating voltage .....6 V/DC via 4 type AA/mignon batteries
- GPS signal input.....PS/2 socket
- Dimensions (W x H x D) .....174 x 187 x 80 mm
- Weight .....425 g (without batteries, incl. GPS receiver)

## Quadrocopter:

Power supply .....	3-cell LiPo battery back (rated voltage 11.1 V)
Dimensions .....	350 x 350 x 220 mm (L x W x H)
Rotor shaft distance.....	425 mm (diagonal)
Propeller size .....	254 x 97 mm (10" x 3.8")
Take-off weight .....	1500 g (incl. rechargeable battery)
Max. turning angle .....	200°/s
Max. tipping angle .....	35°
Max. rising speed .....	6 m/s
Max. dropping speed .....	2 m/s
Max. flight speed .....	15 m/s (in Smart GPS mode only)

## LiPo rechargeable battery:

Voltage.....	11.1 V
Capacity.....	6400 mAh/10C
Max. charge current.....	6 A
Max. discharge current.....	64 A
Permanent discharge current .....	32 A
Dimensions .....	55 x 45 x 145 mm
Weight .....	460 g

## Mains unit:

Input voltage.....	110 - 240 V/AC, 50/60 Hz
Output voltage .....	12.6 V
Output current.....	4 A





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