

# REELY

Ⓒ Operating Instructions

## Electrical quadcopter “Pocket Drone FPV” RtF

Item No. 1642774

CE

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# 1. Introduction

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Dear customer,

Thank you for purchasing this product.

This product complies with statutory national and European regulations.

To ensure that the product remains in this state and to guarantee safe operation, always follow the instructions in this manual.



These operating instructions are part of this product. They contain important information on setting up and using the product. Do not give this product to a third party without the operating instructions.

Keep these operating instructions in a safe place for future reference.

All company and product names are trademarks of their respective owners. All rights reserved.

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

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The symbol with an exclamation mark in a triangle is used to highlight important information in these operating instructions. Always read this information carefully.



The arrow symbol indicates special information and advice on how to use the product.

### 3. Intended use

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The "Pocket Drone FPV" is an electrically-powered quadcopter that is controlled wirelessly using a remote control. It is only designed for private use during permitted operating times.

It is not suitable for other purposes. Using this product for any purposes other than those described above may damage the product and result in a short circuit, fire, electric shock or other hazards. Always follow the safety information in these instructions!

The product must not become damp or wet.

This product is not a toy and must be kept out of the reach of children under 14 years of age.



Always follow the safety information in these operating instructions. It contains important information on how to handle the product safely.

You are responsible for the safe operation of this model!

### 4. Product description

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The "Pocket Drone FPV" is a pre-assembled quadcopter with four rotors and a built-in camera. Quadcopters are used to complete a wide range of tasks. The four rotors can be folded inwards to make the quadcopter easy to transport.

The "Pocket Drone FPV" quadcopter features the latest microprocessor-driven electronics with altitude control and accelerometers, which stabilize its position and altitude. It also features a built-in camera for live transmission, which enables you to fly the quadcopter in "FPV" mode ("first person view"). You can also control the quadcopter with your smartphone and record images and videos.

The quadcopter features high-quality, powerful DC motors with a specially developed drive. An innovative control system and electronic self-stabilization make the quadcopter easy to control.

This product is designed for use in large, enclosed rooms/areas, but can also be used outdoors in still conditions. The built-in electronic controls (gyroscope) can balance out small undesired changes to the quadcopter's altitude, but cannot prevent them altogether. The quadcopter reacts sensitively to wind/draughts due to its lightweight design.

The quadcopter is powered by a built-in LiPo rechargeable battery (not replaceable). The LiPo battery can be charged with the USB charger provided.

The remote control requires 2 AAA batteries (e.g. Conrad item no. 652303, order 2x).

## 5. Package contents

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- Pre-assembled Pocket Drone FPV quadcopter with built-in LiPo battery
- Remote control
- USB battery charger
- Two spare rotors (front)
- Two spare rotors (rear)
- Accessories (tools for changing the propellers)
- Operating instructions

### Up-to-date operating instructions

To download the latest operating instructions, visit [www.conrad.com/downloads](http://www.conrad.com/downloads) or scan the QR code on this page. Follow the instructions on the website.



# 6. Safety information

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Damage caused due to failure to observe these instructions will void the warranty. We shall not be liable for any consequential damages.

We shall not be liable for damage to property or personal injury caused by incorrect handling or failure to observe the safety information! Such cases will void the warranty/guarantee.

Normal wear and tear and accidents or damage caused by a crash (e.g. a broken rotor or chassis components) are not covered by the guarantee/warranty.

Dear customer,

These safety instructions are designed to ensure the safe operation of the product and your personal safety. Read this section very carefully before using the product.

## a) General information

Caution, safety hazard!

This model has the potential to cause damage to property and/or individuals. Ensure that you are sufficiently insured, e.g. by taking out private liability insurance.

If you already have such a policy, check with your insurance company that use of this model is covered by the policy.

Important:

In some EU countries, you are required to have insurance when using a model aircraft.

Familiarize yourself with the local statutory regulations for using model aircraft. In Germany, for example, the regulations for model aircraft are stipulated in the German Air Traffic Act. Any breaches of the statutory regulations could lead to severe penalties as well as restrictions to your insurance cover.

- The unauthorized conversion and/or modification of this product is prohibited for safety and approval reasons.
- This product is not a toy and must be kept out of the reach of children under 14 years of age.
- The product must not become damp or wet.
- Do not leave packaging material unattended, as it may become a dangerous toy for children.
- If you do not have sufficient knowledge of how to operate remote-controlled models, contact an experienced model user or a model club.
- If you have any questions that are not answered by these operating instructions, contact us (see section 1 for contact information) or an experienced technician.



## b) Before first use

- You must learn how to use and control remote-controlled quadcopters. If you have not used such models before, proceed with caution and learn how the model reacts to remote control commands. Be patient!
- Ensure that there are no other models on the same frequency (2.4 GHz) within range of the remote control. Always check whether there are any other 2.4 GHz remote control systems that may interfere with the model.
- Conduct regular checks to verify that the model and remote control are safe to use. Inspect the model for any signs of damage, such as broken mechanical parts (e.g. rotors).
- All moving parts on the model should move freely, but there must be not any slackness in the bearing.
- Charge the built-in quadcopter battery in accordance with these instructions.
- Check that the rotors are secure and in the correct position before each use.
- Ensure that the remote control batteries have sufficient power remaining (use a battery tester). If the batteries are empty, replace all of the batteries together. Never replace individual batteries.
- Keep objects and body parts away from the rotors when the rotors are moving.

## c) During use

- Do not take any risks when using the model! Always use the model responsibly, otherwise you may endanger yourself and your surroundings.
- Improper use can cause serious injury and damage to property! Ensure that you maintain a safe distance from people, animals and objects.
- Select a suitable location to fly the quadcopter. Familiarize yourself with the local regulations for using model aircraft.
- Only fly the model when you are fully alert and able to respond. Fatigue, alcohol and medication can affect your ability to respond.
- Do not fly the model towards spectators or towards yourself.
- The motors, electronics and battery may heat up during use. Leave the quadcopter to cool down for 5 - 10 minutes before charging the battery.
- Always leave the remote control turned on when the model is in use. After landing, move the on/off switch on the quadcopter to the "OFF" position, and then switch off the remote control.
- In case of a fault or a malfunction, establish the cause of the problem before using the model again.
- Do not expose the model or the remote control to direct sunlight or excessive heat for prolonged periods.
- In the event of a severe crash (e.g. from a high altitude), the electronic gyro sensors may be damaged. Always check that the model is functioning properly before flying it again!
- In the event of a crash, switch off the rotor motors immediately. Rotating rotors may be damaged if they come into contact with obstacles or in the event of an impact. Check the rotors for any signs of cracks or damage before flying the quadcopter again!
- To avoid damaging the model due to a crash caused by an undervoltage/overdischarging of the battery, monitor the undervoltage indicators during use.
- Do not exceed the maximum range stated in the "Technical data" section of these instructions. If the quadcopter goes out of range, you will lose control and the quadcopter will continue to fly until it crashes! This will void the warranty/guarantee.



# 7. Battery information

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Batteries present numerous safety hazards. Compared with conventional NiMH rechargeable batteries, LiPo/Li-ion rechargeable batteries have a high energy content. For this reason, it is essential to comply with safety regulations to prevent the risk of a fire or explosion.

Always observe the following safety information when handling batteries.

## a) General information

- Keep batteries out of the reach of children.
- Do not leave batteries lying around, as they present a choking hazard for children and pets. Seek immediate medical advice if a battery is swallowed.
- Batteries/rechargeable batteries must never be short-circuited, taken apart or thrown into fire, as this may cause an explosion!
- When handling leaking or damaged batteries, always use suitable protective gloves to avoid burning your skin.
- Liquids that leak from batteries are very corrosive and may cause serious damage to objects or surfaces that come into contact with them. Always store batteries in a suitable location that is not prone to damage.
- Do not attempt to recharge disposable, non-rechargeable batteries. This may cause a fire or explosion! Non-rechargeable batteries are only designed to be used once and must be disposed of properly when they are empty. Only recharge compatible rechargeable batteries and ensure that you use a suitable battery charger.
- If you do not plan to use the model for an extended period (e.g. during storage), remove the batteries from the remote control to prevent them from leaking and causing damage. The quadcopter battery is built into the quadcopter; store the quadcopter (with the built-in battery) in a cool, dry place out of the reach of children. The same applies for batteries.

Install a smoke detector in the room. Batteries present a fire hazard and may generate toxic fumes. This applies in particular to batteries for model toys, which are subjected to high charging/discharge currents and vibrations.

- Always exchange the entire set of batteries in the remote control. Do not mix full batteries with half-full ones. Always use batteries of the same type and from the same manufacturer. Never mix disposable batteries with rechargeable batteries.
- Always ensure that the remote control batteries are inserted in the correct polarity (observe the plus/+ and minus/- symbols).
- Do not expose the charger or quadcopter (with the built-in battery) to high/low temperatures or direct sunlight.
- Batteries must not become damp or wet. The same applies for the charger and the quadcopter. The charger must only be used in dry, enclosed indoor areas.

Lithium rechargeable batteries (e.g. LiPo/Li-ion batteries) contain chemicals that are very sensitive to moisture (fire/explosion hazard).



- To charge the battery, place the charger and quadcopter on a non-flammable, heat-resistant surface (e.g. stone tiles). Keep the charger and quadcopter away from flammable objects. Ensure that there is a sufficient distance between the charger and the quadcopter.
- Do not charge batteries when they are still hot (e.g. due to a high discharge current in the model). Allow the quadcopter battery to cool down to room temperature before charging it.
- Ensure that there is sufficient ventilation, as the quadcopter battery and charger may heat up during the charging process. Never cover the charger or the quadcopter!
- Never leave batteries unattended when they are charging. Inspect the charger at regular intervals to ensure that the battery is not overheating or expanding. This indicates an imminent risk of a fire or explosion. If the quadcopter battery overheats or starts to expand, disconnect the quadcopter from the charger immediately and take it to a location where it will not cause any additional damage if it explodes or catches fire (e.g. outdoors).
- Disconnect the quadcopter from the charger when the quadcopter battery is fully charged.
- Never damage the casing of a rechargeable battery. Never charge damaged, leaking or deformed batteries. This may cause a fire or explosion! Discontinue use immediately and dispose of the battery in an environmentally friendly manner.
- Rechargeable batteries should be charged regularly (approx. once every 2–3 months) to prevent them from overdischarging. This may result in permanent damage and render the batteries useless.

LiPo/Li-ion batteries usually retain their charge for several months. However, if the batteries overdischarge, this will result in permanent damage and render them useless.

## **b) Additional information about lithium rechargeable batteries**

**Modern lithium rechargeable batteries have a significantly higher capacity than NiMH and NiCd batteries and are more lightweight. This makes LiPo (lithium polymer) or Li-ion batteries particularly suitable for use in model making.**

**However, lithium batteries require particular care to ensure safe charging/discharging, operation and handling.**

**The following section provides an overview of the potential hazards associated with lithium batteries and explains how these hazards can be avoided to ensure a long lifespan.**

- The casing of many lithium batteries is made of a thick film, which is very sensitive. Do not dismantle, drop or insert any objects into lithium batteries. Do not apply mechanical loads or pull on the battery's connection cables. This may cause a fire or explosion!

The quadcopter battery is built into the quadcopter and cannot be replaced.

- Ensure that the lithium battery does not overheat during use, recharging, discharging, transport or storage. Do not place the quadcopter (with the built-in battery) next to sources of heat or in direct sunlight. This may cause the battery to overheat and trigger a fire or explosion! The temperature of the battery must not exceed +60 °C.
- Do not charge the battery if it is damaged or if the outer casing starts to swell/expand (e.g. after a crash). This may cause a fire or explosion!

If the battery is damaged, do not store the quadcopter in an apartment or in a house/garage. Damaged or swollen lithium batteries may catch fire.



- Always use a compatible charger to charge lithium batteries and ensure that the charging specifications are correct. Do not use NiCd, NiMH or lead-acid battery chargers, as these may cause a fire or explosion! Always select the correct charging specifications for your rechargeable battery.
- Always use a balancer when charging a lithium battery with more than one cell (the built-in quadcopter battery only has one cell).
- The charge rate for LiPo/Li-ion batteries must not exceed 1C (or the value stated in the battery instructions). This means that the charging current must not exceed the battery capacity (e.g. battery capacity = 1000 mAh, max. charging current = 1000 mA = 1 A).
- The discharge current must not exceed the value stated on the battery.

For example, if "20C" is printed on the LiPo/Li-ion battery, the maximum discharge current is 20 times the battery's capacity (e.g. battery capacity = 1000 mAh, max. discharge current = 20C = 20 x 1000 mA = 20 A).

Exceeding the maximum current may cause the battery to overheat or become deformed, which can lead to a fire or explosion!

The printed value (e.g. 20C) indicates the maximum current that the battery can deliver for a short period. The continuous current should not be higher than one half of the stated value.

- Do not allow the lithium battery to overdischarge. This may destroy the battery or cause permanent damage.

If your model does not have overdischarge protection or a low battery indicator, stop using it before the battery becomes empty.

## 8. Preparations for flying

### a) Inserting batteries into the remote control

Remove the battery compartment cover on the back of the remote control. Slide the cover in the direction of the arrow (A) and lift the cover off the compartment.

Insert two AAA batteries in the correct polarity (B). Pay attention to the markings on the battery compartment.

Replace the battery compartment cover in the correct position.

→ Using rechargeable batteries is not recommended due to their lower voltage (disposable batteries = 1.5 V, rechargeable batteries = 1.2 V) and their tendency to self discharge (the remote control would quickly indicate that the batteries are empty).

The remote control only uses a small amount of electricity, therefore disposable batteries will last for significantly longer. We recommend using high-quality alkaline batteries.

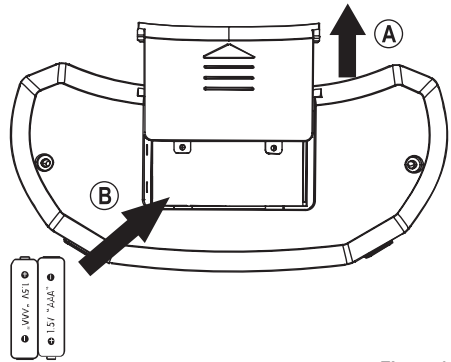


Figure 1

### b) Charging the quadcopter battery

Use a USB power adapter, USB cigarette lighter, computer USB port or a USB hub with its own power adapter (not included) to power the USB charger. This must be able to deliver an output current of at least 500 mA.

Switch off the quadcopter.

Connect the USB connector on the USB charger (B) to the USB power supply, and then connect the small connector (C) on the USB charger to the "CHA" socket (A) on the model.

Charging will begin provided that the battery is not defective (high impedance/disconnected) and the charger is connected to a power supply. The red LED indicator on the USB battery charger lights up to indicate that the battery is charging.

- Constant: Battery is charging
- LED off: The battery is full/fully charged

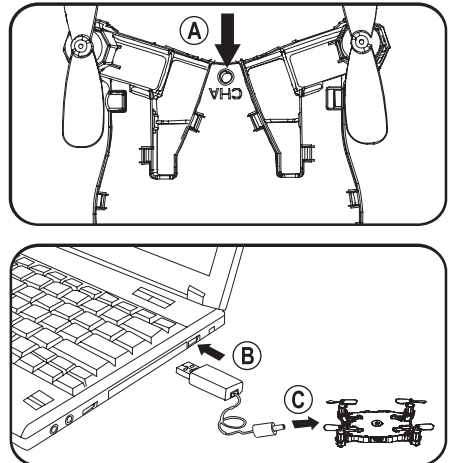


Figure 2

### c) Final assembly

The model is pre-assembled and ready for use.

It features foldable rotors to ensure a compact design and to make the quadcopter easier to transport.

The rotors must be folded outwards before take-off.

To fold out the rotors, press the two unlock buttons (see figure 3, position A) until the rotors click into place (B).

The rotors can be folded back into their initial position for transport or storage.

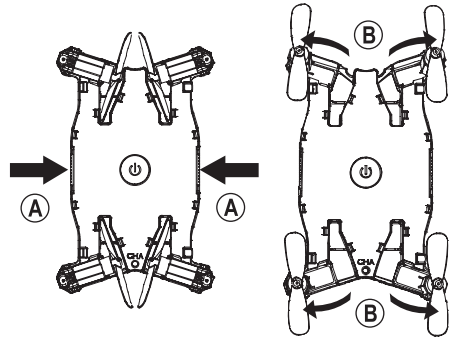


Figure 3

## 9. Remote control buttons

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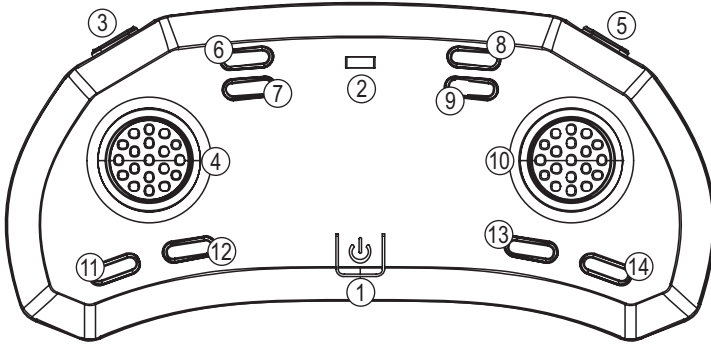


Figure 4

- 1 On/off switch
- 2 LED function indicator
- 3 Flip button
- 4 Left-hand control lever (rise/fall and yaw)
- 5 "Automatic take-off/automatic landing" button
- 6 Flight mode button
- 7 Calibration button
- 8 Forwards pitch button
- 9 Backwards pitch button
- 10 Right-hand control lever (roll and pitch)
- 11 Headless mode button
- 12 "Return" button
- 13 Left roll trim button
- 14 Right roll trim button

# 10. Safety features

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→ The "Pocket Drone FPV" quadcopter and remote control come with a range of safety features to prevent the model from being damaged and reduce possible damage to a minimum. The LED indicator on the quadcopter and the optical warning signal on the remote control indicate when a safety feature is activated.

## a) Remote control

The battery status is continuously checked when the remote control is in use. If the battery voltage drops below a certain level, the LED on the on/off switch (figure 4, position 2) will start to flash. If this occurs, stop flying the quadcopter immediately and replace the remote control batteries.

## b) Model

The LEDs in the quadcopter chassis stay constant when the quadcopter is paired with the remote control and receiving a signal. If the LEDs are flashing, this indicates that the quadcopter is not receiving a signal and you will need to repeat the pairing process.

The quadcopter constantly monitors the voltage of the built-in quadcopter battery. When the battery is full, all LEDs in the chassis will turn on. If the battery voltage drops below a critical level for a certain duration, the LEDs will start to flash.

If the battery voltage stays below the critical level, the quadcopter will initiate an emergency landing and the motors will switch off.



When the undervoltage LEDs start to flash, this indicates that the battery only has enough charge to power the quadcopter for 20 - 30 seconds in order to bring the model back to its take-off position.

When the quadcopter battery voltage drops below a certain level, the remote control will be disabled and the quadcopter will initiate an emergency landing. This process cannot be controlled with the remote control.

If the model is over a body of water, tree, house, street, people, animals or other objects and/or the model is higher than 1 m above the ground, the model may be damaged and cause injury or damage to property.

If the model lands on its back (rotors point towards the ground), the motors will switch off automatically. You can manually switch off the motors by holding down the "Automatic take-off/automatic landing" button (see figure 4, position 5). The app has an icon for switching off the motors.

# 11. Before first use

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→ This manual uses the standard terms for controlling a quadcopter. These are used in aviation terminology and are in widespread use.

Directions are given from the perspective of a "virtual" pilot. The direction is indicated by the red LEDs in the chassis (these indicate "backwards").

## a) Hovering the quadcopter

Hovering denotes a status in which the quadcopter neither rises nor falls. This means that the lifting force is equal to the weight.

After starting the quadcopter with the "Automatic take-off/automatic landing" button (figure 4, position 5), slide the left-land control pad (figure 4/5, position 4) forwards to increase the motor speed and make the quadcopter move upwards. Pull the control pad backwards to make the quadcopter fall. When the control pad is in the neutral position, the quadcopter uses the built-in sensors to maintain the current altitude.

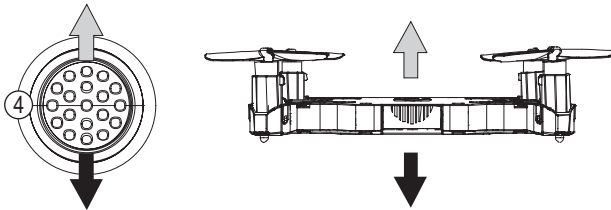


Figure 5

→ The quadcopter may be affected by turbulence and air currents during take-off and when the quadcopter is just above the ground. This may cause the quadcopter to respond more quickly to remote control commands or move forwards, backwards or sideways. This so-called "ground effect" disappears at an altitude of approximately 50 cm.



## b) Yaw function

"Yaw" refers to the rotation of the quadcopter about the vertical axis. This movement occurs either unintentionally due to the torque of the rotors, or intentionally to change the flight direction. The yaw is controlled by changing the speed of the individual rotors.

Move the left-hand lever (figure 4/6, position 4) to the left to rotate the quadcopter to the left, or move the lever to the right to rotate the quadcopter to the right.

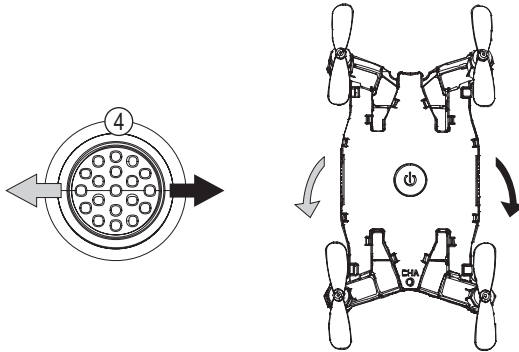


Figure 6

## c) Pitch function

"Pitch" refers to the movement of the quadcopter about the horizontal axis (comparable to a nodding head). This makes the quadcopter accelerate/brake forwards or backwards.

Move the right-hand lever (figure 4/7, position 10) forwards to make the quadcopter move forwards, or pull the lever backwards to make the quadcopter move backwards.

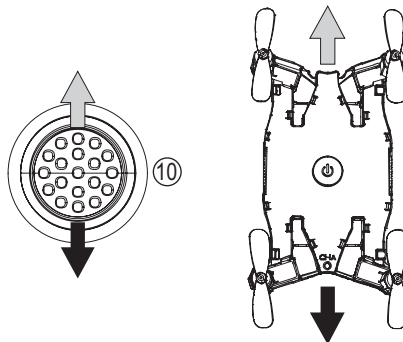


Figure 7

## d) Roll function

"Roll" refers to the movement of the quadcopter about the longitudinal axis (comparable to the sideways movement of a ball or crab). One side of the quadcopter is lifted to make the quadcopter move sideways (independent of the forwards/backwards motion).

Move the right-hand lever (figure 4/8, position 10) to the left to make the quadcopter move to the left, or move the lever to the right to make the quadcopter move to the right.

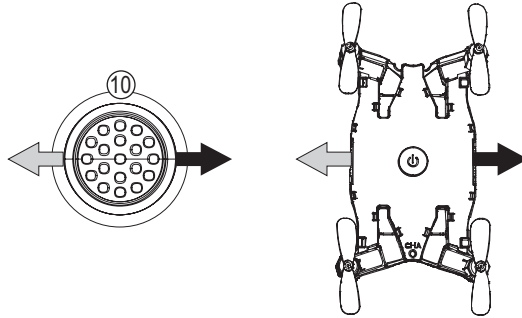


Figure 8

## e) Flight mode

Depending on your level of experience, you can choose between two flight modes.

To change the flight mode, press the flight mode button (figure 4, position 6) on the remote control.

Beginner mode restricts the sensitivity of control commands so that you can quickly learn how to fly the quadcopter. This mode is recommended for pilots with no or very little experience of quadcopters.

→ Beginner mode is enabled by default each time you switch on the remote control.

Advanced mode is recommended for pilots with experience of flying other quadcopter models. In this mode, the quadcopter is significantly more agile than in beginner mode. To enable advanced mode, press the flight mode button (figure 4, position 6) on the remote control numerous times until you hear two beeps. Press the "flight mode" button again to switch back to beginner mode (indicated by a single beep).

→ In the app there are three different modes. Professional mode is recommended for pilots with extensive quadcopter experience. In this mode, the quadcopter is more agile than in advanced mode. To enable professional mode in the app, touch the "flight mode" symbol on your smartphone numerous times until the maximum level (100%) is indicated.

## 12. First take-off

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### a) Starting the quadcopter



You must learn how to use and control a remote-controlled quadcopter. If you have not driven a similar model before, proceed with caution and learn how the model reacts to remote control commands. Be patient! Refer to the instructions in section 11.

Do not take any risks when using the product! Always use the model responsibly, otherwise you may endanger yourself and your surroundings.

Ensure that the quadcopter battery is fully charged.

Switch on the quadcopter (using the button in the middle of the chassis). The LEDs in the chassis will start to flash once per second. The (red) LEDs should face backwards (towards you) and indicate "backwards".

Place the model on a level, smooth surface (e.g. stone floor). Carpets/rugs are not suitable, as the quadcopter may get caught.

Switch on the remote control using the on/off switch. The remote control will beep to indicate that it is switched on and the LED indicator on the remote control will start to flash.

Push the left-hand control pad (figure 4, position 4) forwards, and then pull it backwards. The LED indicator on the remote control and the LEDs in the quadcopter will stay constant. Move the left-hand control pad back into the neutral (central) position.

The quadcopter is now paired with the remote control and ready for use.

Press the "Automatic take-off/automatic landing" button (figure 4, position 5) to start the rotors. The rotors will start and the model will take off automatically.

Increase the rotor speed by slowly moving the left-hand control pad forwards until the quadcopter rises and hovers in front of you at a height of approximately 1.5 m.

→ Avoid sudden and excessive movements. Observe whether the quadcopter drifts, and if so, in which direction it drifts. If the quadcopter drifts sideways ("roll") or forwards/backwards ("pitch"), move the right-hand control pad in the opposite direction.

To land the quadcopter, slowly pull the left-hand control pad backwards when the quadcopter is in the desired landing position and wait until the quadcopter reaches the ground. A firm landing is permissible and should not be corrected with abrupt commands.

To turn off the rotors, pull the left-hand control pad (figure 4, position 4) downwards for approximately two seconds until the rotors stop moving. Alternatively, press the "Automatic take-off/automatic landing" button (figure 4, position 5) again.

Try to land the quadcopter in a vertical position (like a helicopter). Avoid landing at high horizontal speeds (like an aeroplane). If you have not already done so, switch off the motors after landing.

Practice take-off and landing a few times to get a feel for the quadcopter. Once you are reasonably confident, you can start controlling the flight direction using the yaw, pitch and roll functions (see instructions in section 11). Always move the controls slowly and practice a few times before attempting a new manoeuvre. The first flights should not last longer than 30 to 60 seconds.

Once you are familiar with how the quadcopter responds to your commands, you can practice other manoeuvres. Start with simple manoeuvres (e.g. moving 1 metre forwards/backwards (pitch function)), and then practice tilting left/right (roll function). Once you have practised these manoeuvres, you can practice circles and figures of eight.

To switch off the quadcopter, switch off the rotors after landing and move the on/off switch on the quadcopter to the "OFF" position (the LEDs will turn off). Then switch off the remote control.

## b) Trimming the quadcopter

→ The quadcopter is not 100% stable and may drift in a certain direction. This is caused by external factors (e.g. wind) and incorrectly calibrated sensors (gyroscopes). This is normal and the drift can be largely eliminated by calibrating the sensors and using the trim function.

If the quadcopter drifts in one direction, trim the quadcopter in the opposite direction using the corresponding trim on the remote control.

For example, if the quadcopter drifts forwards (pitch), press the backwards pitch trim button (figure 4/9, position 9) numerous times until the quadcopter stops drifting forwards. If the model drifts backwards, use the forwards trim button (figure 4/9, position 8).

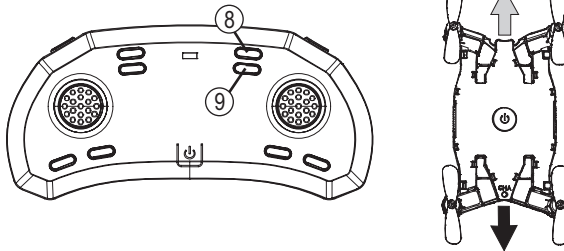


Figure 9

If the quadcopter drifts to the left (roll), press the right-hand roll trim button (figure 4/10, position 14) numerous times until the quadcopter stops drifting to the left. If the model drifts to the right, use the left-hand trim button (figure 4/10, position 13).

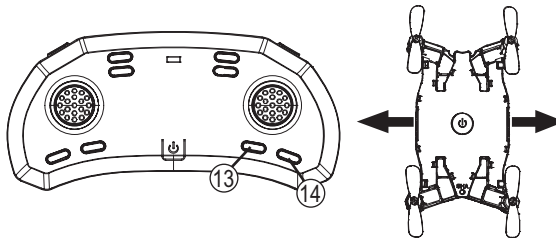


Figure 10

## c) Calibrating the quadcopter

If the trim is not sufficient to make the quadcopter hover in a fixed position (e.g. after a crash), the sensors need to be recalibrated. Place the quadcopter on a level surface.

Press the "Calibration" button (figure 4, position 7) on the remote control. The LEDs on the quadcopter will flash rapidly.

The LEDs will stay constant when calibration is complete.

## d) Using the automatic take-off/automatic landing button



### Important!

The quadcopter must not be surrounded by any obstacles. This feature is therefore only suitable for use in large rooms/halls or outdoors. For safety reasons, people and objects must be at least 2 m away from the take-off position.

The automatic landing feature is a preprogrammed sequence. Before you press the automatic landing button, the model must be in a stable position (hovering) in order to ensure a safe, automatic landing. Ideally, the quadcopter's altitude should not exceed 1.5 m and the landing position should be at least 2 m from obstacles and people.

If this is not the case, the quadcopter may be damaged or may cause injury or damage to property!

Automatic take-off and landing are initiated with a button (figure 4, position 5).

To use the automatic take-off feature, place the quadcopter on a level surface and ensure that it is at a sufficient distance from the pilot and obstacles (see instructions above). To start the quadcopter, press the "Automatic take-off/Automatic landing" button (figure 4, position 5) on the remote control. The rotors will start and the quadcopter will take off. You can then control the quadcopter using the control levers on the remote control.

To land the quadcopter, choose a suitable landing site (see instructions above) and ensure that the quadcopter is hovering in a stable position at a height of max. 1.5 m. Press the "Automatic take-off/Automatic landing" button (figure 4, position 5) on the remote control. The model will start to drop vertically and the rotors will switch off automatically after landing.

→ During the landing phase, you can use the remote control to correct the direction of travel.

## e) Flight movements

After take-off, the quadcopter will start to hover provided that the controls have been trimmed correctly.

To make the quadcopter ascend, carefully push the left-hand control pad on the remote control forwards. Return the left-hand control pad to the neutral position to stop the ascent. To make the quadcopter descend, carefully pull the left-hand control pad downwards. Return the left-hand lever to the neutral position to stop the descent.

Move the left-hand control pad to the left to make the quadcopter rotate to the left about the vertical axis. Turn the lever to the right to make the quadcopter rotate to the right.

Carefully push the right-hand control pad forwards to make the quadcopter move forwards, or pull the right-hand control pad backwards to make the quadcopter move backwards.

Move the right-hand control pad to the left to make the quadcopter move to the left. Move the right-hand control pad to the right to make the quadcopter move to the right.

→ For more information on controlling the quadcopter, refer to the instructions in section 11.

## f) Flip function

The quadcopter can make flip manoeuvres (360° turn). To use the flip function, move the quadcopter to a height of at least 3 m and make it hover at a sufficient distance from the pilot and other obstacles.

Press the flip button (figure 4, position 3) on the remote control. The remote control will beep with a steady rhythm to indicate that you have selected the flip function. It will continue to beep until the quadcopter completes the flip manoeuvre.

Briefly move the right-hand control pad in the direction in which you want the quadcopter to flip.

Examples: Move the right-hand control pad forwards to make the quadcopter flip forwards. Move the right-hand control pad to the right to make the quadcopter flip to the right.

After selecting the flip direction, move the right-hand control pad back into the neutral (centre) position immediately.



### **Important!**

The flip function should only be used when the quadcopter is flown in a large hall/room or outdoors and hovering at a height of at least 3 m at a distance of at least 5 m from people and obstacles before the flip button is pressed.

If this is not the case, the quadcopter may be damaged or may cause injury or damage to property in the event of a crash or contact!



For safety reasons, the flip function is automatically disabled when the quadcopter battery is low (flashing LEDs).

The quadcopter can only flip in one direction (forwards, backwards, right or left). The flip direction must be selected on the remote control (move the right-hand control lever forwards, backwards, right or left). When the flip function is enabled, avoid using illegal commands (e.g. moving the right-hand control lever forwards and left at the same time). This may result in you losing control of the quadcopter and cause a crash.

The flip function is automatically disabled when the quadcopter completes the flip manoeuvre. To start another flip manoeuvre, enable the flip function on the remote control.

## g) Headless mode

In headless mode, the quadcopter always moves in the direction of the remote control levers, regardless of its orientation. For example, when you move the control lever to the right, the quadcopter will always move to the right (regardless of which direction the quadcopter is facing). In this mode, you can move the right-hand control pad (pitch and roll) in the direction in which you wish the quadcopter to travel.



### Important!

The remote control and quadcopter must be aligned when headless mode is enabled. Headless mode can therefore only be enabled when the quadcopter is on the ground. The quadcopter should be aligned so that the (red) LEDs are facing backwards.

If you fail to observe these instructions, the quadcopter may not respond as expected and may travel in a different direction.



Headless mode is controlled using relatively simple technology (without a compass or GPS). As a result, it is normal for the quadcopter to deviate from the desired direction of travel.

When the quadcopter is not in headless mode, you need to consider the orientation of the quadcopter (e.g. when the quadcopter is travelling towards you and you move the lever to the left, the quadcopter moves to the right). In headless mode, you do not need to consider the orientation. This makes the quadcopter easier to control for beginners. However, if you wish to learn how to fly a quadcopter in the standard configuration, you should avoid using headless mode and learn how to fly the quadcopter in the standard mode.

To enable headless mode, pair the remote control with the quadcopter (prepare the quadcopter for take-off). The rotors are still off when headless mode is enabled for the first time. Align the quadcopter on the ground so that the red LEDs face the remote control.

Press the headless button (figure 4, position 11) until you hear a long beep. The LEDs on the quadcopter will flash rapidly to indicate that headless mode is enabled.

Start the quadcopter. When headless mode is enabled, the quadcopter will always move in the direction of the right-hand lever (regardless of the quadcopter's orientation). For example, when you move the control pad forwards, the quadcopter will always move away from you. When you move the control pad to the right, the quadcopter will always move to the right.

To disable headless mode, press the headless mode button (figure 4, position 11) until you hear a short beep. The LEDs on the quadcopter will stop flashing to indicate that headless mode is disabled.

## h) Return function

The quadcopter features a return button that returns the quadcopter to the pilot. This button can also be used in headless mode (see previous section). To use the return function, press the return button on the remote control (see figure 4, position 12). Use the right-hand control pad on the remote control to correct the flight path.

To disable the return function, press the return button on the remote control (see figure 4, position 12), or move the right-hand control pad (pitch) forwards.



### **Important!**

The return function should only be used when the quadcopter is hovering at a height of at least 2 m at a distance of at least 5 m from people and obstacles.

If this is not the case, the quadcopter may be damaged or may cause injury or damage to property in the event of a crash or contact!

The return function uses relatively simple technology (without a compass or GPS). As a result, it is normal for the quadcopter to deviate from the desired direction of travel.

The quadcopter does not detect obstacles. Before pressing the return button, ensure that there are no obstacles between the quadcopter and remote control (return flight path).



# 13. FPV mode

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## a) General information

The quadcopter comes with a camera that can transmit live video wirelessly to a compatible smartphone (not included). You can install an app on your smartphone to take photos and record video. Images and video can be saved and edited on your smartphone. The live video transmission enables you to use the quadcopter in "FPV mode" ("FPV" = First person view).



### Important!

Using the quadcopter in FPV mode increases the risk of an accident, as there may be obstacles that are not displayed in the camera image. In FPV mode, the quadcopter must be observed by a co-pilot who can warn you about potential hazards. Flying the quadcopter in FPV mode requires lots of practice. When practising, ensure that the flight path is far away from obstacles, people, animals, buildings and streets.

To prevent interference when the camera is transmitting video signals, ensure that there are no other remote controls within range of the quadcopter that operate on the 2.4 GHz frequency. Ensure that Bluetooth® is disabled on your smartphone.

FPV mode is only available when the quadcopter is controlled via a smartphone. However, the area of the camera image is significantly reduced by the onscreen icons and your fingers.

## b) Downloading the app

→ A smartphone app is required to use FPV mode. The app is free and you will not incur any additional costs other than those that you would normally incur for downloads.

Depending on your operating system, scan one of the QR codes below (iOS or Android). You will be automatically directed to the download page for the current version of the app. Alternatively, search for the "REELY" app in the App Store (Apple devices) or Google Play Store (Android devices).



Figure 11: App for iOS



Figure 12: App for Android



REELY

### c) Preparing the quadcopter for take-off

Prepare the quadcopter for take-off by pairing it with the remote control. The quadcopter will emit a Wi-Fi signal (similar to a Wi-Fi router).

On your smartphone, go to "Settings" and enable Wi-Fi. Search for the "REELY-xxxxx" network (xxxxx = number/letter combination) from the list of available Wi-Fi networks. This network is generated by the quadcopter and must be connected to your smartphone. When you have connected the quadcopter to your smartphone, exit your smartphone settings and open the app.

### d) Basic app functions

Figure 13 shows the app's home screen. There are two options:

- (A) "?" (question mark) = Help
- (B) "CONNECT" = Start the app



Figure 13

If you do not have access to the instruction manual, you can touch the question mark (A) to view usage instructions. Touch the icon in the upper-left corner to exit the help menu.

Select "CONNECT" (B) to open the interface in figure 14.

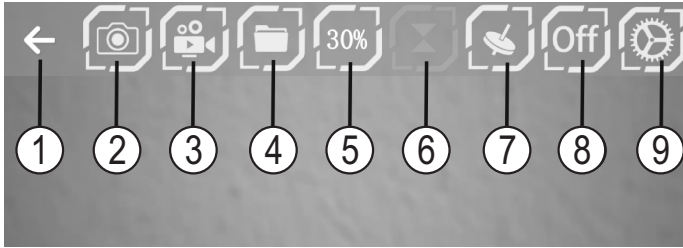


Figure 14

The icons in the top row (1–9, see figure 14) have the following functions:

- 1 Exit the current screen
- 2 Take a photo with the quadcopter camera
- 3 Record a video with the quadcopter camera
- 4 View saved images and videos
- 5 Flight mode (30 % = Beginner, 60 % = Advanced, 100 % = Professional; see section 11. e)
- 6 Altitude control (the quadcopter attempts to maintain the current altitude; only available when the control icons are displayed)
- 7 "Gravity sensor mode": Controls the "pitch" and "roll" functions with the position sensors on your smartphone; only available when the control icons are shown.
- 8 "OFF"/"ON": (Display or hide the control icons for starting rotors/landing, rotor emergency stop, control icons for the rotor speed, yaw, roll, pitch and trimming).
- 9 Cog icon: Display/hide the icons for "VR mode" and "Calibration" – see instructions in the following section.

When you select the cog icon (see figure 15, position 9), the following additional icons are displayed:

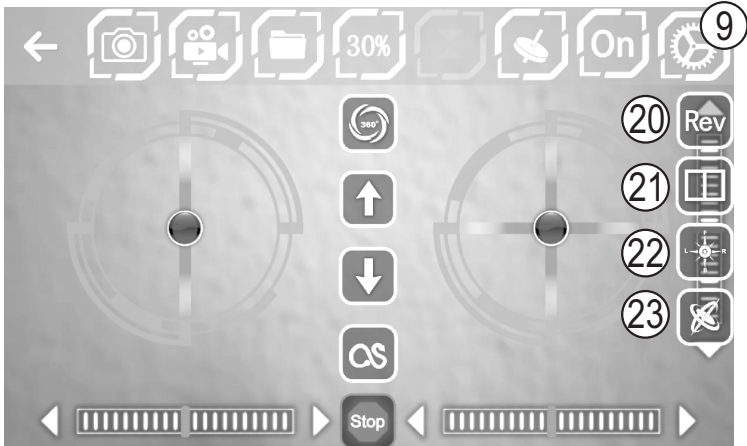


Figure 15

- 20 "REV": Rotates the camera image by 180°
- 21 "VR": Displays a live 3D image (requires a VR headset).
- 22 Headless mode (see section 12)
- 23 Calibration (calibrates the sensors in the quadcopter, see section 12)

## e) In-app controls

Symbol #8 ("OFF") must be selected in order to start the quadcopter with the app. When you select this symbol, it changes to "ON" and the control icons are displayed. Select symbol #6 to display additional icons in the centre of the display.

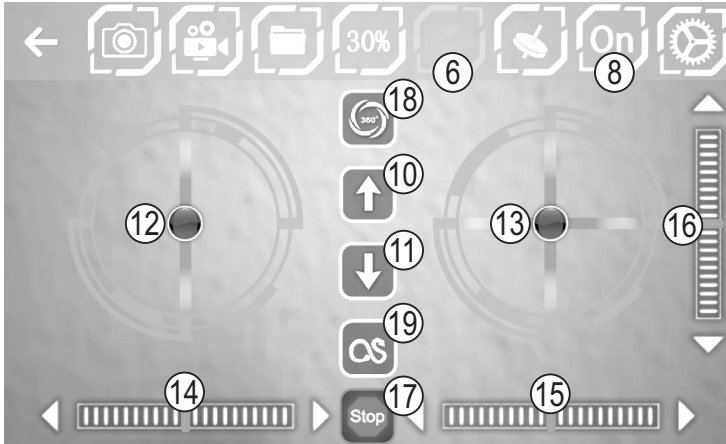


Figure 16

The onscreen icons can be used to control the quadcopter. The icons have the following functions:

- 10 Automatic take-off (the rotors start and the quadcopter takes off)
- 11 Automatic landing (the quadcopter lands automatically and switches off the rotors)
- 12 "Rise/fall" and "yaw" control icon
- 13 "Pitch" and "roll" control icon
- 14 "Yaw" trim icon
- 15 "Roll" trim icon
- 16 "Pitch" trim icon
- 17 Emergency rotor stop (e.g. after a crash)
- 18 Flip icon (enables the flip function, see section 12. f)
- 19 Flight route (the quadcopter automatically flies in the shape (e.g. circle) or route indicated on the display)



### Important!

When using automatic flight mode, the quadcopter must not be surrounded by any obstacles. This feature is therefore only suitable or use in large rooms/halls or outdoors. People and objects must be at least 10 m away from the take-off position. If this is not the case, the quadcopter may be damaged or may cause injury or damage to property!

A live image of the quadcopter camera will be displayed when the quadcopter is ready for take-off and you have enabled the app with the "CONNECT" icon. You can then start the quadcopter and fly the quadcopter in FPV mode using the camera image. In this configuration, the quadcopter is controlled with the smartphone.

To take a photo or record a video with the quadcopter camera, touch the corresponding icon on your smartphone display (see figure 14, positions 2 and 3).

→ Continuous shooting is not possible. Touch icon #2 in figure 14 to enable the camera, and then release the icon to take a photo. Touch icon #3 in figure 14 to end a video recording.

A stopwatch is displayed during video recordings to indicate the recording duration. To end a recording, touch the corresponding icon. The recording will stop, the stopwatch will disappear and the recording will be saved.

→ You can also capture images during video recordings.

## 14. Controlling the quadcopter with your smartphone

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→ The "Pocket Drone FPV" quadcopter can be controlled with a smartphone instead of the remote control. There are two possibilities that are displayed in sequence.

To prevent interference with the transmission of flight commands and video signals, ensure that there are no other remote controls within range of the quadcopter that operate on the 2.4 GHz frequency. Ensure that Bluetooth® is disabled on your smartphone.

Compared with the remote control, the quadcopter responds more slowly and less precisely to smartphone commands. When controlling the quadcopter with a smartphone, be patient and ensure that there are no obstacles in the surroundings.

### a) Recording/viewing images or videos

The quadcopter features a built-in camera that can be used to record images and videos via the smartphone app. Images and videos are saved to your smartphone.

When you have finished flying the quadcopter, you can view images and videos on your smartphone. Touch the corresponding icon on the display (figure 14, position 4). A new screen will be displayed.

Select "Pictures" or "Video". Another screen with the recorded images/videos will be displayed. Touch the desired file to view the corresponding image/video. To delete an image/video, select the corresponding file (touch and hold) and follow on the onscreen prompts.

## **b) Controlling the quadcopter with the app icons**

When you start the app, a number of icons are displayed with the camera image (see figure 16). In addition to the camera control icons (see figure 14, position 2 - 4), the remote control icons are displayed when you select the corresponding icon in figure 16, position 6/8. The left-hand control icon (figure 16, position 12) controls the altitude and rotation about the vertical axis (yaw). The right-hand control icon (figure 16, position 13) controls the pitch and roll.

Figure 16 shows the trim icons for "yaw" (position 14), "roll" (position 15) and "pitch" (position 16).

To trim a function, touch the left/right arrow (for "yaw") or top/bottom arrow (for pitch) until the quadcopter responds as desired. Refer to section 12. b) for more information on how to trim the quadcopter.

### **To control the quadcopter with your smartphone and in-app controls, follow the steps below:**

Switch the quadcopter on. The LEDs in the outrigger arms will start to flash and the quadcopter will emit a Wi-Fi signal.

Switch on your smartphone. Go to "Settings/Wi-Fi" and connect your smartphone to the "REELY-xxxx") network.

On your smartphone, launch the "REELY" app for the "Pocket Drone".

Select "CONNECT". The in-app control icons will be displayed (see figure 14) together with the video image from the built-in camera.

Place the quadcopter in a suitable take-off position. Refer to the instructions in sections 11 and 12.

Select the icon in position 6, figure 14, and then select the icon in position 6, figure 14. The control pads will appear as "points" together with all other icons that are needed to control the quadcopter (see figure 16).

The LEDs on the outrigger arm should now be constant. This indicates that the quadcopter is connected to the smartphone app.

Select the icon in position 10, figure 16. The rotors will start and the model will take off and hover in front of you at a height of approximately 1.5 m.

The two control icons (see figure 16, positions 12 and 13) function like the control pads on the remote control. Keep your smartphone in your hands. Touch each "point" with your finger (for best results, use your thumb) and control the quadcopter in the same way as you would with the remote control (see section 11 and 12).

To land the quadcopter, move the left-hand control icon (figure 16, position 12) backwards slightly. Alternatively, initiate an automatic landing by selecting the icon in figure 16 (position 11).

### c) Other in-app controls

By default (see figure 14, position 5), the app is set to 30 % of the maximum steering range. This corresponds to beginner mode (see section 11) and restricts the impact of steering commands.

An additional bar is displayed when you touch this icon again (figure 14, position 5). The steering range is now set to approximately 60 % of the maximum. This corresponds to advanced mode, which makes the quadcopter more agile.

Touch the icon again (figure 25, position 5) to set the steering range to 100 % of the maximum. This corresponds to professional mode, which does not restrict the control functions.

Touch the icon again to revert to the first level (30 %).

Select the icon in position 18, figure 16 to enable the flip function. Move the right-hand control icon (figure 16, position 13) forwards to make the quadcopter perform a forwards somersault. Refer to the instructions in section 12.

Touch the icon in figure 16 (position 19) to enable the "flight route" function. The left-hand control icon will stay on the screen and can be used to control the altitude and yaw. The right-hand control element will not be displayed. Use this space to draw a flight path (see figure 17, e.g. a circle). The quadcopter will automatically follow the designated route. Bring the quadcopter into a stable position and enable flight route mode (touch icon #19). Draw a route on the display. When you have finished drawing a route (lift your finger from the display), the quadcopter will immediately follow the designated route.

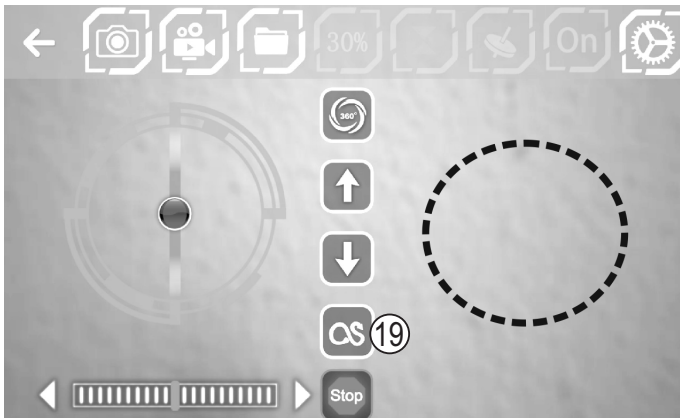


Figure 17



#### Important!

When using automatic flight mode, the quadcopter must not be surrounded by any obstacles. This feature is therefore only suitable for use in large rooms/halls or outdoors. People and objects must be at least 10 m away from the take-off position. If this is not the case, the quadcopter may be damaged or may cause injury or damage to property!

The automatic flight route feature is a preprogrammed sequence and requires the quadcopter to be in a stable position (hovering). Ideally, the quadcopter's altitude should not exceed 1.5 m and the route should be at least 10 m from obstacles and people.



Touch the cog icon (figure 14, position 9) to display additional control icons.

Touch the "REV" icon (figure 15, position 20) to invert the video image by 180° (the image will turn upside down).

The "VR" icon (figure 15, position 21) activates a "quasi 3D mode". The live image from the camera is split into two parts on your smartphone screen. This allows you to connect your smartphone to a VR headset (not included, must be purchased separately) and use FPV mode in 3D (i.e. with spatial perception). Enable 3D mode in the app and insert your smartphone into the VR headset (refer to instruction manual for details). Wear the VR headset and start the quadcopter.

Select the icon in position 22, figure 15 to enable headless mode. Refer to the instructions in section 12 for more information on how to use headless mode.

→ If the trim controls are not sufficient to prevent the quadcopter from drifting or responding abnormally, the sensors must be recalibrated. Place the quadcopter on an even, level surface and touch the calibration icon (figure 15, position 23). The LEDs in the outrigger arms will start to flash. The LEDs will stay constant when calibration is complete.

## **d) Controlling the quadcopter with your smartphone's position sensors**

Smartphones contain position sensors, which are used to detect the orientation of the device and rotate the display. These sensors can also be used to control the quadcopter's "pitch" (forwards and backwards) and "roll" functions (left and right).

To control the quadcopter with your smartphone's position sensors, follow the instructions in section 14. b) to prepare the quadcopter for take-off, and then select the icon in position 7, figure 14 to activate position sensor control.

Keep your smartphone horizontally in your hands.

Touch the "Automatic take-off" (fig. 16, position 10) or "Automatic landing" (fig. 16, position 11) to make the quadcopter take off or land.

Use the left-hand control icon (figure 16, position 12) to control the altitude and the rotation about the vertical axis.

The smartphone's position sensors are used to control the left/right and forwards/backwards movement (instead of the right-hand control icon). Tilt your smartphone forwards to make the quadcopter move forwards. Tilt your smartphone backwards to make the quadcopter stop or move backwards. Tilt your smartphone to the left to make the quadcopter move to the left. The quadcopter will move in the same direction as your phone.

# 15. Maintenance, servicing and repairs

## a) Regular cleaning

The "Pocket Drone FPV" quadcopter has a very simple design. There are no mechanical parts that require lubrication or other maintenance. However, the quadcopter should be cleaned after each use to remove any dirt (e.g. woollen threads, hairs and dust).

Clean the quadcopter with a dry or slightly damp cloth and do not allow the electronic components, battery or motors to come into contact with water.

## b) Replacing the rotors

Rotors that are damaged by a crash or other impact should be replaced immediately. This also applies in the event that there are small cracks. Due to the high speed of rotation, components on damaged rotors may become loose and damage the surroundings.

To change a rotor (figure 18), carefully remove the rotor from the motor shaft using the lever provided. Attach the new rotor, ensuring that the rotor rotates in the same direction as the motor (see markings on the bottom of the rotor and outrigger arm ("A")). Proceed with caution and do not apply excessive force.



### Important!

Pay attention to the motor's direction of rotation (see markings on outrigger arm) and ensure that the rotor is attached in the corresponding orientation (see markings on rotor). The outrigger arm marked "A" must be attached to a rotor marked "A". If the rotor is attached in the wrong orientation (e.g. outrigger arm = A, rotor = B), the quadcopter will not function properly after take-off and the guarantee/warranty will no longer be valid!

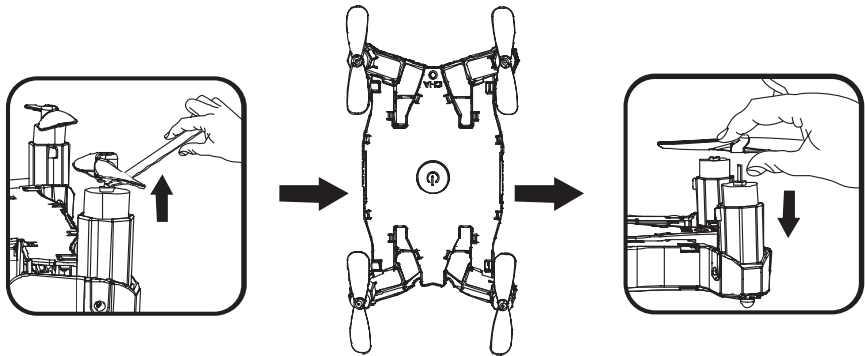


Figure 18

# 16. Disposal

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## a) Product



Electronic devices are recyclable waste and must not be placed in household waste. Always dispose of the product according to the relevant statutory regulations.



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

## b) Batteries

You are required by law to return all used batteries (Battery Directive). They must not be placed in household waste.



Batteries containing harmful chemicals are labelled with this symbol to indicate that disposal in household waste is forbidden. The abbreviations for heavy metals in batteries are: Cd = Cadmium, Hg = Mercury, Pb = Lead (indicated on the battery, e.g. below the waste bin icon on the left).

Used batteries can be returned to local collection points, our stores or battery retailers.

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

# 17. Declaration of Conformity (DOC)

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Conrad Electronic SE, Klaus-Conrad-Straße 1, D-92240 Hirschau, hereby declares that this product conforms to the 2014/53/EU Directive.



Click on the following link to read the full text of the EU Declaration of Conformity:

[www.conrad.com/downloads](http://www.conrad.com/downloads)

Select a language by clicking on the corresponding flag symbol and then enter the product order number in the search box. The EU Declaration of Conformity is available for download in PDF format.

## 18. Technical data

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### a) Remote control

Frequency range .....	2.451 - 2.478 GHz
Transmission power.....	10 dBm
Remote control range.....	Max. 20 - 30 m (with no obstructions)
Operating voltage .....	3 V/DC (2 AAA batteries)
Dimensions (W x L x H).....	130 x 61 x 17 mm
Weight (without batteries).....	Approx. 46 g

### b) Quadcopter

Flight time .....	Approx. 4 - 5 minutes
Length (folded) .....	110 mm
Width (folded) .....	63 mm
Height (folded).....	12.3 mm
Length (unfolded) .....	99 mm
Width (unfolded) .....	63 mm
Height (unfolded).....	29.3 mm
Rotor diameter.....	Approx. 37 mm
Take-off weight .....	Approx. 36.2 g

### c) Wi-Fi

Transmission frequency.....	2.412 - 2.472 GHz
Transmission power.....	9 dBm
Range.....	Approx. 25 - 30 m (obstructions)

### d) Camera

Camera resolution .....	0.9 MP
Resolution (Image and video).....	1280 x 720 pixels
Frame rate .....	25 FPS
Image angle.....	120°
Video format .....	mp4 (with Android), mov (with iOS)
Image format .....	.jpg

**e) Quadcopter battery**

Rated voltage .....3.7 V/DC  
Capacity.....250 mAh  
Discharge rate .....Max. 20 C

→ The quadcopter battery is built into the quadcopter and cannot be replaced.

**f) USB battery charger**

Operating voltage .....5 V/DC (via USB)  
Required input current.....min. 500 mA  
End-of-charge voltage ..... 4.2 V (LiPo 1S)  
Charging time .....Approx. 45–60 minutes

**g) General information**

Permissible usage locations .....In buildings and outdoors in calm weather  
Temperature range .....0 °C to +40 °C  
Humidity.....Max. 75 % relative humidity, non-condensing  
App .....Android 4.4 / iOS 7.0 or later





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