

INNOVATION & TECHNOLOGY

Graupner

Manual

Alpha 110 Q

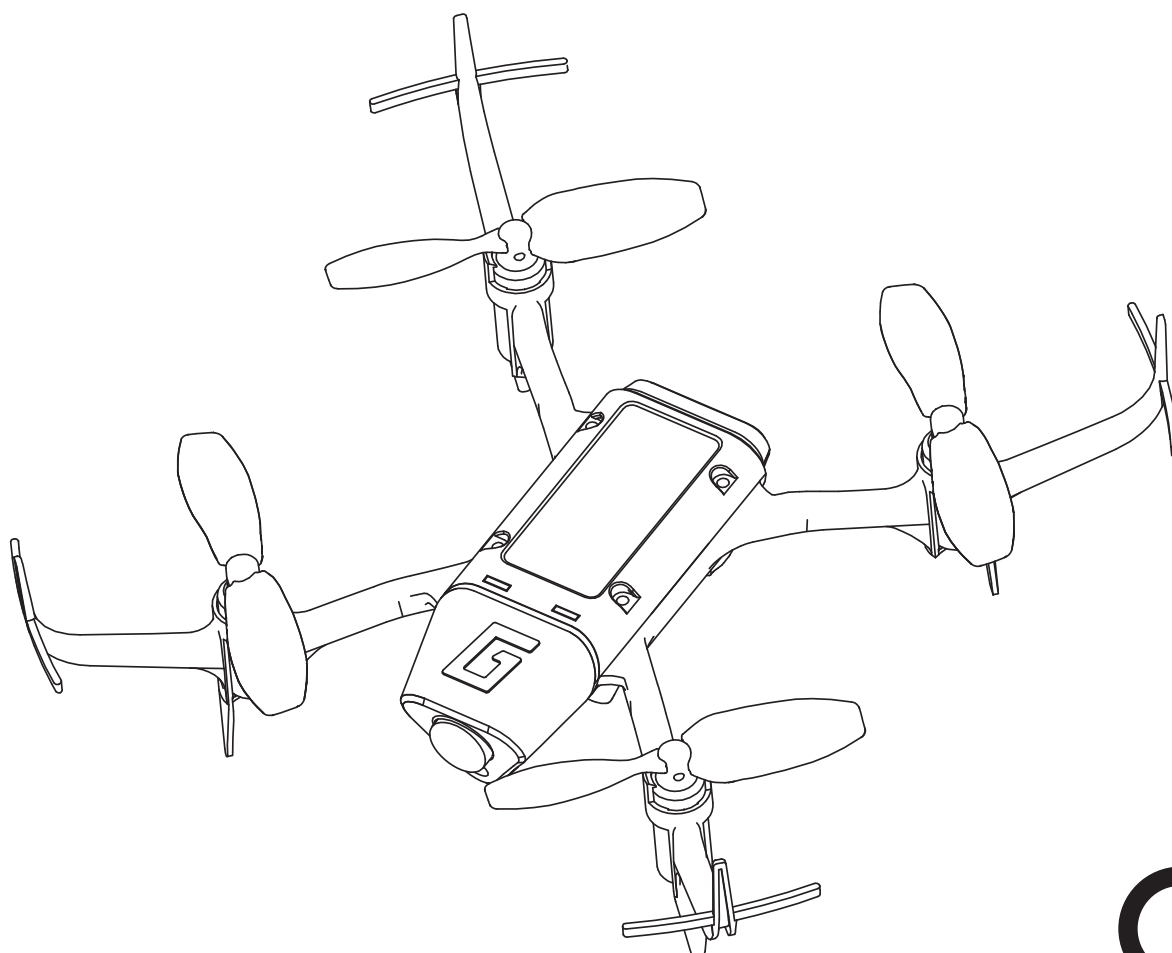
Quadrocopter

S5012.RFH (Copter)

S5012.RTF (Copter with transmitter)

S5012.FPV (Copter with camera)

EN



TEST VERSION, DO NOT USE FOR PRINTING

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Introduction

Thank you very much for purchasing a Graupner **Quadrocopter Alpha 110**. This **Alpha 110 Quadrocopter** is extremely versatile. This manual is valid for all speed controllers listed on the cover sheet.

Read this manual carefully to achieve the best results with your **Alpha 110 Quadrocopter** and first of all to safely control your models. If you experience any trouble during operation, take the instructions to help or ask your dealer or **Graupner Service Centre**.

Due to technical changes, the information may be changed in this manual without prior notice. Be always updated by checking periodically on our website, **www.graupner.de** to be always up to date with the products and firmwares.

This product complies with national and European legal requirements.

To maintain this condition and to ensure safe operation, you must read and follow this user manual and the safety notes before using the product!



Note

This manual is part of that product. It contains important information concerning operation and handling. Keep these instructions for future reference and give it to third person in case you gave the product.

Service Centre

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Intended use

Copter Alpha 110Q

The **Alpha 110 Quadrocopter** is a remote controlled Quadrocopter. Other components are required to complete the functionality of the **Alpha 110 Quadrocopter**. (See section required accessories). Punctual technical information about the components of this kit can be found in the Technical data section.

The **110D Quadrocopter** is designed exclusively to be used as a battery-powered, radio controlled model, any other use is not allowed. For any improper use no warranty or liability is accepted.

Read through this entire manual before you attempt to assemble or use or use the **Alpha 110 Quadrocopter**.

Graupner/SJ constantly works on the development of all products; we reserve the right to change the item, its technology and equipment.

Target group

The **Alpha 110 Quadrocopter** is not a toy. It is not suitable for children under 14 years. The assembly and operation of the **Alpha 110 Quadrocopter** must be performed by experienced modellers. If you do not have sufficient knowledge about dealing with radio-controlled models, please contact an experienced modeller or a model club.

Transmitter MZ-8 (only by S5012.RTF)

This remote-control system may only be used for the purpose specified by the manufacturer for operation of remote control models without passengers. Any other type of use is impermissible and may damage the system and cause significant property damage and/or personal injury. No warranty or liability is therefore offered for any improper use not covered by these provisions.

Read through this entire manual before you attempt to install or use the transmitter.

Graupner/SJ constantly works on the development of all products; we reserve the right to change the item, its technology and equipment.

Target group

The product is not a toy. It is not suitable for children under 14 years. The operation of the **mz-8 HoTT transmitter** must be performed by experienced modelers. If you do not have sufficient knowledge about dealing with radio-controlled models, please contact an experienced modeler or a model club.

Package content

S5012.RFH

Alpha 110 Quadrocopter
Propellers
Battery, battery charger
Manual

S5012.RTF

Alpha 110 Quadrocopter
Propellers
Battery, battery charger
S1008 MZ-8 HoTT transmitter
Manual

S5012.FPV

Alpha 110 Quadrocopter with camera and video transmitter
Propellers
Battery, battery charger
Manual

Technical Data

Symbols explication



Always observe the information indicated by this warning sign. Particularly those which are additionally marked with the **CAUTION** or **WARNING**. The signal word **WARNING** indicates the potential for serious injury, the signal word **CAUTION** indicates possibility of lighter injuries.



The signal word **Note** indicates potential malfunctions. **Attention** indicates potential damages to objects.

Safety notes

This safety notes are intended to protect you and other people. They are also used for safe handling the product. Therefore please read this section very carefully before using the product!

Do not carelessly leave the packaging material lying around, since it might become a dangerous toy for children.

Persons, including children, with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, or not capable to assemble and use safely the **Alpha 110 Quadrocopter** must not use the **Alpha 110 Quadrocopter** without supervision or instruction by a responsible person.

Operation and use of radio-controlled models needs to be learned! If you have never operated a model of this type before, start carefully and make yourself familiar with the model's reactions to the remote control commands. Proceed responsibly.

First, always perform a range and function test on the ground (to do so, hold your model tight), before you use your model. Repeat the test with running motor and with short throttle bursts.

Inform yourself before flying your model on which maximum altitude you can fly in the uncontrolled airspace over the starting position and do not exceed it.

Before you start using the remote control model, you have to check the further relevant laws and regulations. These laws you must obey in every case. Pay attention to the possibly different laws of the countries.

The insurance is mandatory for all kinds of model operation. If you already have one, so please inform yourself if the operation of the respective model is covered by your insurance. If this is not the case, conclude a special liability insurance policy for models. We recommend to provide the **Alpha 110 Quadrocopter** with a label, where are indicated the name, address, tel. n., E-mail and Insurance N. So that the copter can be clearly assigned in the event of a crash.

Due to safety and licensing reasons (CE), any unauthorized reconstruction and/or modification of the product is prohibited.

Only use the components and spare parts that we recommend. Always use matching, original **Graupner** plug-in connections of the same design and material.

Make sure that all of the plug-in connections are tight. When disconnecting the plug-in connections, do not pull the cables.

Protect the Copter from dust, dirt, moisture and other foreign parts. It must be protected from vibration as well as excessive heat or cold. The models may only be operated remotely in normal outside temperatures such as from -10°C to +55°C.

Only operate all your **HoTT** components using the current software version.

If you have questions which cannot be answered by the operating manual, please contact us (contact information see page 3) or another expert in the field.

WARNING



Safety notes during the use

Also while programming, make sure that a connected electric motor cannot accidentally start. Injury risk by the turning propellers! Always remove the propellers when programming. Program always the motors stop switch on the transmitter. (See transmitter manual)

Avoid shock and pressure. Check the **Alpha 110 Quadcopter** regularly for damages to the housings and cables, specially after model crashes. Damaged or wet electronic components, even if re-dried, should no longer be used!

Never touch the turning propellers, this can cause serious injury.

The propellers must be mounted securely, thrown parts can cause serious injury.

Keep long hair, loose clothing such as scarves, loose shirts or similar well away from the danger zone of the revolving propeller, they may be withdrawn by the propeller, flying debris can cause serious injury.

Observe the safety notes of the required components.

Safety notes for battery

- ◆ LiPo batteries are not a toy. Persons, including children, with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, or not capable to use safely the battery must not use the battery without supervision or instruction by a responsible person.
- ◆ Any alterations to the battery, charger or charging cables can cause serious injury. Risk of fire and explosions! Risk of burns!
- ◆ Do not use any damaged battery or charger, risk of short-circuit and fire!

CAUTION



Storage

LiPo batteries should be stored with a voltage of about 3,8V per cell. If the cell voltage falls below 3 V, then the battery must be necessarily charged. Deep discharge and storage in discharge status (cell voltage < 3V) make the battery useless. For transport and storage the LiPo batteries must be placed in a safety case e.g. No. 8371.

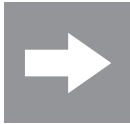
WARNING



Safe use of the battery charger

- ◆ Persons, including children, with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, or not capable to use safely the charger must not use the charger without supervision or instruction by a responsible person.
- ◆ The battery charger should be connected only to power sources which voltage complies with the indications on the label! See technical data. Risk of fire!
- ◆ The connection socket for the battery is polarized, Never use force while inserting the connector . It must plug easily. Short-circuit and fire risk!
- ◆ The battery charger can be used only in dry spaces.
- ◆ The charger should always be supervised during charge and it should be used only in rooms fitted with a smoke detector.
- ◆ A damaged charger or power cord must not be used until they are repaired by the manufacturer, his customer service or a suitably qualified person. Electric shock risk!
- ◆ The charger is only suitable for LiPo batteries, it cannot charge other types of batteries (e.g. NiCd, LiFe, Pb). If you connect other type of batteries to the charger, both battery and charger can be damaged, risk of fire and explosions!
- ◆ A wet charger, even if re-dried, should no longer be used. Risk of electric shock!
- ◆ Due to safety and licensing reasons (CE), any unauthorized reconstruction and/or modification of the product is prohibited. Risk of electric shock!
- ◆ Protect the charger from dust, dirt, moisture and other foreign parts. It must be protected from vibration as well as excessive heat or cold.
- ◆ Do not cover the charger during charge, the ventilation slots must be free. Risk of fire!

- ◆ The charger and the battery to be charged must be placed on a non-combustible, heat-resistant and non-conducting surface during operation. Do not use the charger near easily flammable materials.
- ◆ Always disconnect the charger from the power supply when it is not in use.

**Note:**

After you perceive your model, check if all components are inside the package and eventual damages.

Remove the battery from the model when transporting or when not in use.

During transport protect the model and the transmitter from damages.

**Care:**

Clean the Copter, the battery and the charger only with the suitable cleaners. Good is a spirit-free cloth. Never use chemical cleaners, solvents, petrol, alcohol or similar.

Charging copter's battery

Plug the USB connector of the included charger to a suitable 5 V port.

1. The LED on the charger will light green.
2. Plug the battery connector to the charger charging port.
3. The LED will turn from green (stand by mode) to red (charge mode).

When the charge process has finished, the LED lights on green again. Then is the battery fully charged.

4. Unplug first the battery connector from the battery charger and then the USB cable from the power supply.

Transmitter power supply

The **mz-8** HoTT transmitter is normally delivered with three alkaline batteries.

The transmitter battery voltage is monitored by a status LED during operation.

If the voltage drops below 3,2 V, an acoustic alarm will sound and the red status LED starts to blink quickly. Now at the latest, stop operation and change the transmitter batteries!

Inserting the transmitter batteries

To insert the transmitter batteries remove the battery case cover on the back side of the transmitter. Insert the included batteries in the holder paying attention to the correct polarity (see figure)

Removing the transmitter batteries

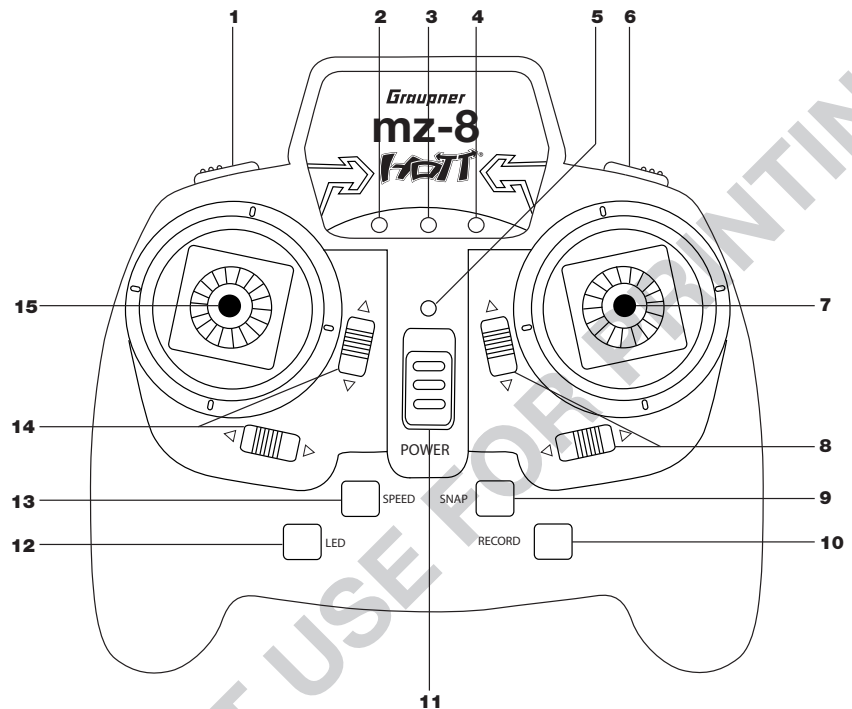
If the transmitter is not going to be used for a long time, the batteries should be removed from the device to avoid damages to the transmitter due to electrolyte leaks.



Transmitter description (only by version S5012.RTF)

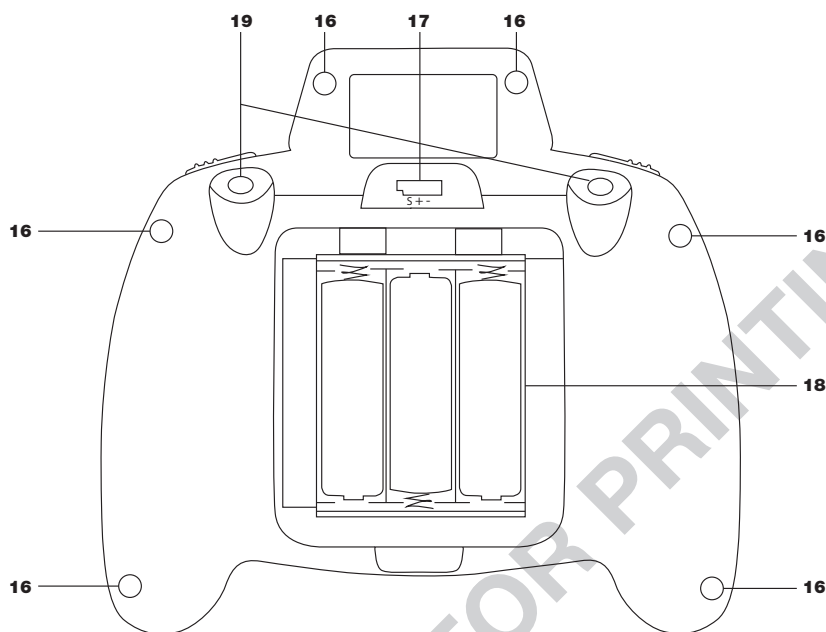
Control elements on the transmitter

Front side



1	Motor-off switch
2	LED, yellow (indicates motor-off active)
3	LED, red (indicates camera recording)
4	LED, green (if off indicates: Attitude mode, if on: Rate mode)
5	LED, red (indicates status and binding)
6	Switch for Attitude and Rate mode
7	Right control stick
8	Trim
9	Button for photographs (only by Alpha 150Q)
10	Button for video recording (only by Alpha 150Q)
11	On/off switch
12	Switch for LED lights and binding
13	Switch for Attitude and Rate mode
14	Trim
15	Left control stick

Back side



16	Case screws
17	DATA socket
18	Battery case
19	Fixture points for attachment holder

Mode setting

The transmitter MZ-8 HoTT is normally delivered in mode 1, throttle on the right, or in mode 2, left throttle. This configuration can be changed through a software.

You can find the software as free download on the **mz-8 HoTT** item page on www.graupner.de.

If you have the mode 1 version, you can change your transmitter into mode 3 through the software.

If you have the mode 2 version, you can change your transmitter into mode 4 through the software.

»MODE 1« (right thr.)				»MODE 2« (left thr.)			
Nick forward		Motor full thr.		Motor full thr.		Nick forward	
Yaw left		Yaw right		Yaw left		Yaw right	
		Roll left				Roll left	
Nick backward		Motor idle		Motor idle		Nick backward	

Preparation before use

The following components are required to use the model: Transmitter HoTT (MZ-8 / MX-12 / MZ-12 or higher) MZ-8 included by S5012.RTF.

For the version S5012.FPV will be required a video goggle or an FPV monitor to fly in FPV.

Receiver

The transmitter is already completely set to work properly with the **Alpha 110 Quadcopter**. To program some parameters, refer to the section "Receiver settings".

Installing the battery in the copter

Fix the battery in the battery case. Place the battery so that the **Alpha 110 Quadcopter**'s center of gravity is in the middle.

Receiver's binding

The included receiver is already bound to the MZ-8 transmitter in the version S 5012.RTF. In the other versions without included transmitter, you can bind the copter receiver with your favorite HoTT transmitter. Thereto read the manual of your HoTT transmitter. The copter receiver is already in binding mode as soon as it is switched on. Then siply start the binding process in the transmitter.

Binding with the MZ-8 transmitter

If you want to bind the copter with the MZ-8 transmitter push the "LED" button on the transmitter when the copter is switched on.

If the binding process was successful the status LEDs will light red on the transmitter and green on the copter.

Range test

The integrated range test reduces the transmitter output so that you can perform a function test at a distance between 5 and about 10 m.

Perform the range test for the **Graupner**-HoTT system according to the following instructions. It is useful to have an assistant to help you with the range test.

Switch on the transmitter and the copter then wait until the green LED on the copter lights. You are now able to monitor control movements.

Place the model on a flat surface (cement, mowed lawn or ground) so that the receiver antennas are at least 15 cm above the ground. It may therefore be necessary to place a support underneath the model during the test.

Hold the transmitter at hip level at a slight distance from your body.

You can start the range test process by pushing simultaneously the "SPEED + SNAP" buttons.

The red status LED on the transmitter will start to blink quickly and a signal tone is emitted twice each two seconds.

After the 90 second range test, the transmitter switches back to full output, and the signal tone stops.

You can stop the range test in every moment by pushing the POWER button.

During the 90 seconds, walk away from the model and move the sticks. If you detect an interruption in the link within a range of about 5 - 10 m at any time, attempt to reproduce it.

Move further away from the model until it does not respond perfectly. Move further away from the model until it does not respond perfectly.

At this location, wait for the remainder of the test period with the still operable model. The model should still react to control commands once the range test is finished. If this is not 100 % the case, do not use the system and contact our Service department.

Perform a range test before each flight, and simulate all control movements that could occur during the flight. In order to guarantee a safe model operation, the range must always be at least 5 - 10 m on the ground.



Attention!

Never start a range test on the transmitter during normal model operation!

Factory reset

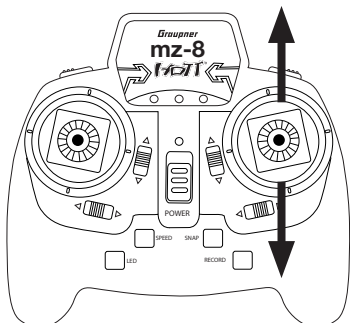
If it was necessary to erase all the values saved in the copter, you can make a factory reset. Therefor proceed as follows:



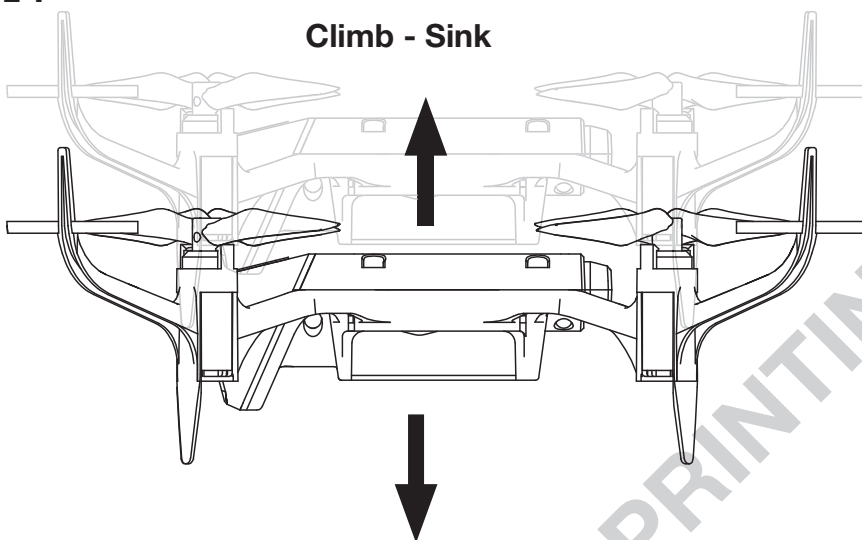
Attention! all model memories will be deleted!

Push all the trims to the inside and then switch the transmitter on. In this way all the saved values will be deleted.

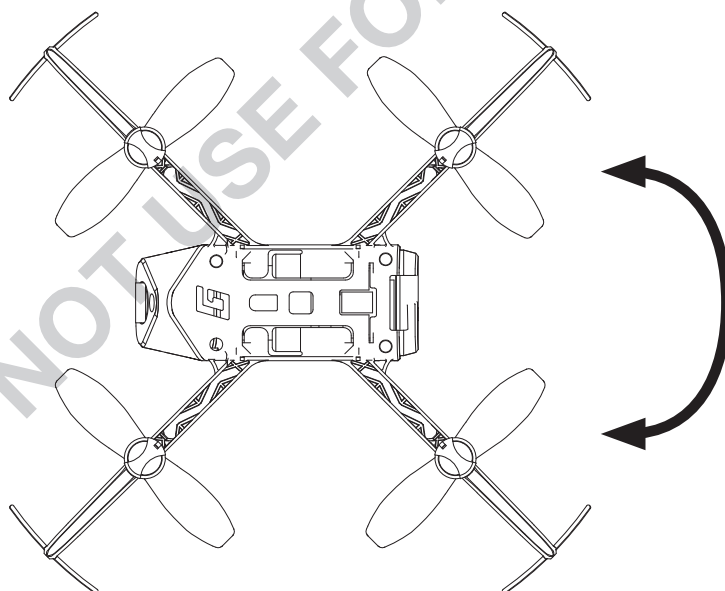
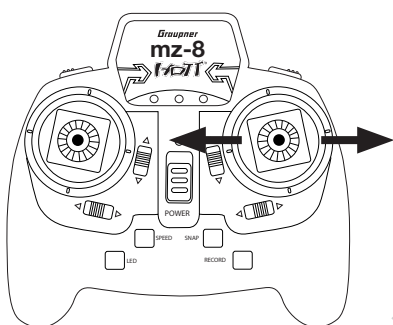
Example flight control MODE 1



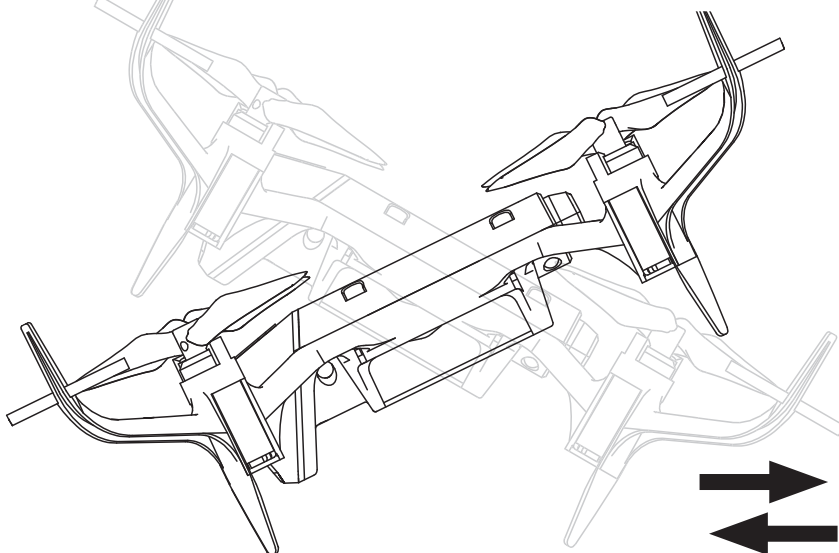
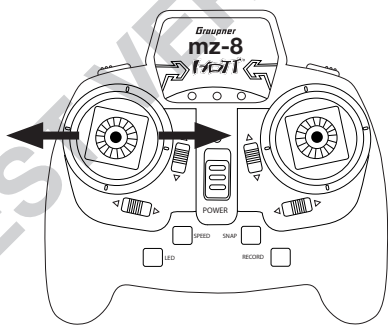
Climb - Sink



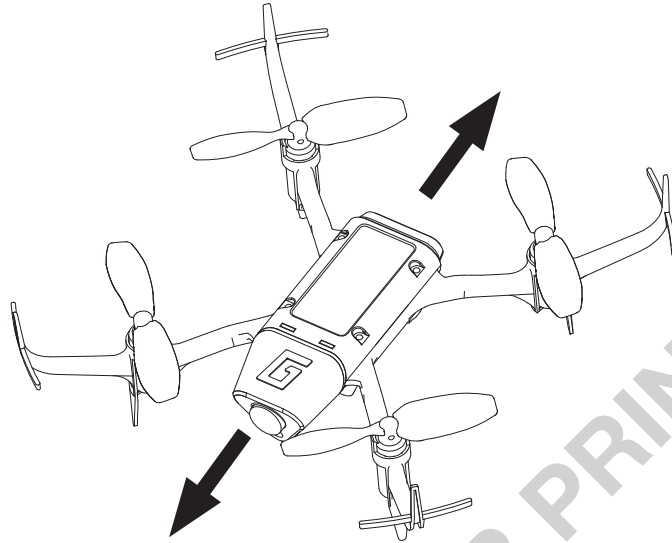
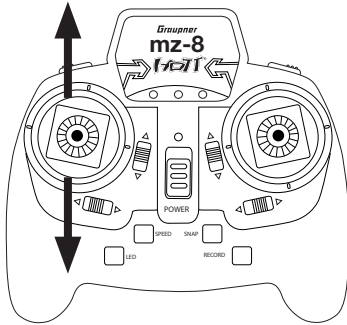
Turn on its own axis



Roll to the right and left



Forward and backward



Auto-flip function

The copter can autonomously perform a roll by pushing a button if, while flying it in Attitude mode, you push the neutralizing control stick (the opposite to the throttle stick), a quick acoustic signal is emitted for 5 seconds. If during these 5 seconds you move the nick or roll control more than 50%, the Quadrocopter performs autonomously a 360° turn (Flip) in the direction of the control that you moved. The copter cannot always come back to its prior position, eventually you may have to correct its position after the roll.

Camera function by version S 5012.FPV

Through the installed camera and the video transmitter is emitted a video signal. The transmission starts as soon as you connect the copter battery. Scan the transmission signal of the copter in your video goggles or video monitor.

SPEED

If you push the "SPEED" button you can switch between video transmission channels during the flight.

The "SNAP" and "RECORD" buttons are functionally only in the model Alpha 150Q, because this model is equipped for video recording on an SD memory card.

Installing the propellers

CAUTION



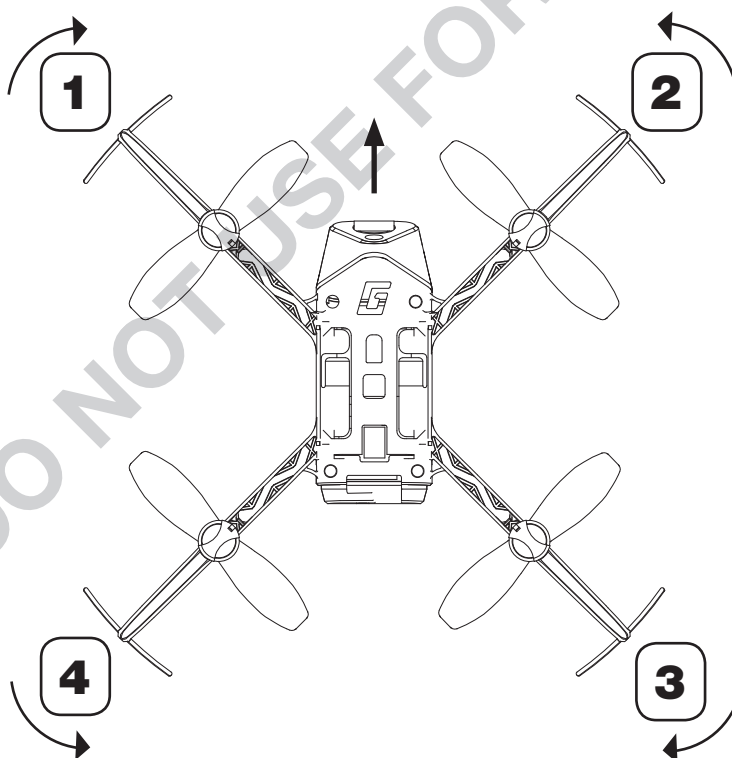
Risk of injury through rotating propellers by motors start. Always unplug the connector to the battery before working on the propellers.

Install the propellers as shown in the picture below. Pay attention to install the proper propeller to each motor. The propeller rotation sense is written on the propeller (R/L)! The image represents the copter seen from the top.

white, R+L (front 1+2) / red, R+L (back 3+4)

1 = Clockwise motor
propeller (.L)

2 = Counter-clockwise motor
propeller (.R)



4 = Counter-clockwise motor
propeller (.R)

3 = Clockwise motor
propeller (.L)

First flight

Choose a free area for your first flight. Select first always the Attitude mode because so the copter is easier to control and the throttle course is different in Rate mode. Take firstly confidence with the flight attitude of the **Alpha 110Q**. Proceed carefully and responsibly.

Initialization by switching on

Initialization of the gyro

Once the model has been switched on, the gyro immediately becomes active but still needs to be initialized. To initialize the gyro, keep your model still when you switch it on. The calibration process can only be performed when the receiver is absolutely still. After 3 seconds in still position you will hear beeps emitted by all motors. The signal tone can vary depending on the esc model. These "wiggles" signal that initialization has been successful and that calibration is complete. Always wait until the calibration process has finished before starting to fly the model. The motors will not start until the calibration is complete.

CAUTION



If the copter is used for long time (>1 min) in Acro 3D mode the receiver can loose its position information and the copter can move itself out of control. Before switching back to Attitude mode, hover the copter for 30 s or land it in Rate mode, so that the receiver can reset the position.

Receiver setting (only possible in connection with HoTT transmitter with display)

Special function channel 6

The auto-flip function allows you to flip your copter in a very easy way. It is essential that you control in Attitude mode (function not allowed in Rate mode).

The auto-flip function must be controlled by **channel 6**. For this program a 2-way switch (e. g. SW1) in the transmitter control menu on channel 6 with the following values:

Auto-flip function on = Channel 6 > 110%

Auto-flip function off = Channel 6 < 110%

Activate the switch and within 5 sec move the nick or roll stick to more than 50% of its course, then the copter makes autonomously a flip in the selected direction. After the flip it is possible to have some little position movements (<10°).

Receiver's base settings

Step 2 Basic settings

```
Multicopter Basis<v>  
>Type      Quadro X  
Mode       NORMAL  
ONESHOT    No  
Minpower % 10  
Calibr. Posit. No
```

Type

Quadro x, Quadro +, Tri L, Tri R

Here it must always be selected the setting Quadro X.

Channel connections to the receiver for the different copter types.

Connect the speed controllers of the motors to the receiver following the proper scheme (see next page "Connection scheme of different copter types").

In case of tricopter use only digital servos for servo 4.

Motor direction seen from the top of the copter!

MODE

ESC settings for the learning of the controller the receiver K1 signal will be passed directly to the controller.

Normal is set for 'normal' multicopter (without reverse rotation).

Acro 3D setting for multicopter whose speed controllers are equipped with reverse rotation. (Acro flight mode)

Note:

For safety reason the **Type** and **Mode** changes take effect after switching off and on (only for this parameter).



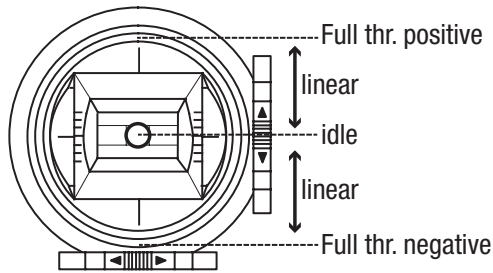
CAUTION



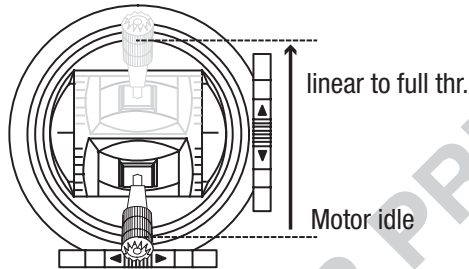
Risk of injury by rotating propellers when motors are running. The motors can start while switching from Attitude to Rate mode. Hold the throttle stick in central position when you switch. Install the propellers only as very last operation before flight.

Start and land always in Attitude mode. Note that in Rate mode the throttle curve has different reaction. (See sketch on the right) Example: If the throttle stick is down when you turn in rate mode, the motors run at once fully backward.

Thr. course
Rate mode



Thr. course
Attitude mode



Optional mixer for reduction of throttle curve in attitude mode

M1		[S] → 5	1\ ⇒
►M2		C1→C1	3\ ⇒
M3		?? → ??	
M4		?? → ??	
M5		?? → ??	
▼		Fro to	—

MIX 2	CH1→CH1
►TRV -30% 0%	
Offs 0%	
▼ [SYM] ASY	

Throttle curve in Acro 3D mode

Optional: If the motor off area is not desired in Attitude mode then you can reduce the lower servo travel to -70%. Thus the reduction has no effect on the rate mode, program the reduction through a switchable free mixers. In this mixer the reduction is active only in Attitude mode. (see display screenshot on the left)

Minpower%

The setting is principally used to prevent the motors shut down in flight. Adjust so that the motors are running straight. Under no circumstances unnecessarily high set, this would limit the controller possibilities.

ONESHOT

Oneshot is a quick communication protocol between receiver and speed controller and should only be activated if the speed controllers allow this function. It allows the speed controllers to communicate much faster with receiver. So the motors react faster to receiver controls. The motor output signal is now shorter, about 125µs-250µs, instead of before PWM (1000µs – 2000µs).

CALIBR. POSITION

With **Calibr. Position** the acceleration sensors can be calibrated so that in attitude mode with stick and trim neutral, the copter is precisely horizontally aligned. For this purpose, it is simply placed on absolute level surface and set the value to Yes. After a moment, it jumps back to No and the calibration is done. Do not forget to store disabling the field!

Axis assignment

Step 3

Axis assignment in the gyro

Axis assignment <	
>Setup	No
ROLL	+0
NICK	+0
YAW	+0

Setup: Setup: Yes/No

Assignment of the gyros and their operating direction.

In the receiver's "Axis assign" menu, go to the "Setup" option and set it to "Setup: Yes". Now assign the axes as follow:

On the transmitter, briefly set the roll command fully to the right; the roll axis is highlighted. Roll the copter more than 45 degrees to the right the identified axis with the required prefix is displayed, the field is no longer highlighted and identification of this axis is complete.

Now do the same for nick: on the transmitter, briefly set the nick command so that it is fully forward. Roll the copter more than 45 degrees forwards; the axis is displayed, the field is no longer highlighted and identification of this axis is complete.

Finally complete the procedure for yaw: on the transmitter, briefly set the yaw command fully to the right. Turn the copter so that the nose turns more than 45 degrees to the right; the axis is displayed, the field is no longer highlighted and identification of this axis is complete.

The gyros and operating directions have now been assigned. Now check to make sure that the operating directions are correct.

To do this remove the propeller of the copters and give approximately a quarter throttle, all motors are running at the same speed.

Tilt the Copter in Attitude mode so that its nose is facing downwards the front motors must turn faster than back ones. Tilt the Copter in Attitude mode to one side the motors of the side, in witch you tilt the model, must turn faster then the motors on the other side.

Roll and Nick setting

Step 4

Optional setting for Roll and Nick

```
Multicopter RO/NIC >
>ROLL/NICK P      40
ROLL/NICK D       30
DAMPING           2
ROLL FACTOR %     100
POWER2SENS. 80
--ATTITUDE MODE--
ROLL/NICK I       40
AGILITY           3
```

```
Multicopter RO/NIC >
--RATE MODE--
R/N RATE I       20
RATE             6
```

For Attitude and Rate mode:

ROLL/NICK P

Set this parameter in steps of 5 higher and higher, until a medium-speed overshoot occurs. Then go some steps back in order to prevent the soar up climb in case of full throttle.

ROLL/NICK D

Now adjust well to the D component in steps of 5, until the Copter engages exactly on nick and roll. A too high value leads to very rapid oscillations.

DAMPING

The damping factor should be set as low as possible, but as high as necessary, so that the PID control can operate optimally and the setting can be increased at best. If you do not get vibrations away with the PID settings, then change the damping of 1 step and test whether the setting works better or worse. Recommended settings:

For Racecopter with fast controllers and 5-6 inch props: **1 - 2**

For copters with fast controllers and 8 inch propellers: **2**

Copter with bigger propellers: **2** or higher.

ROLL FACTOR %

Set the Roll setting as percent value of the overall gain. For symmetric Copters the value can be 100. If, because of its gravity center, the Copter is more agile on the Roll axis than on the Nick axis, then you can change here the roll factor. In the **Graupner ALPHA RACE 250 Q** this value is set about 65%.

POWER2SENS.:

Very strong drives can lead to oscillating at full throttle. This parameter allows you to set a kind of gyro suppression. Higher values result in an increased gyro suppression towards full throttle.

Only for attitude mode

ROLL/NICK I

Set the I component of the Attitude mode. At too low values of Copter swings slowly. If it stops after a roll or pitch command and "oscillates", the value must be reduced.

AGILITY

Agility determines at what speed (yaw rate) a new position is occupied.

Only for rate mode

R/N rate I

Sets the I component of the rotation in rate mode. At too low values of Copter swings slowly. If it stops after a roll or pitch command and “oscillates”, the value must be reduced.

RATE: Sets the max. potential rate of rotation in Rate mode.

Multicopter Yaw settings

Multicopter Yaw<v>	
>Yaw P	40
Yaw I	20
Yaw D	10

Yaw P - Factor

Default setting: +45

The P factor is responsible for the harder snap to yaw. Higher values result in a faster stop. At too high P-values the copter starts to “swing”. In such cases, the value must be reduced again.

Yaw I - Factor

Default setting: +15

The I-factor ensures constant rotations. Start with low values and only increase them until the rotations are constant. Too high value cause an oscillation when you stop and possibly the motors can run higher. This can lead to an undesirable rise.

Yaw D - Factor

Default setting: 10

The D-factor affects the stopping behavior in yaw. In most Copters a hard D action is necessary. The D component must be set as low as possible, since it affects the whole system.

Transmitter's firmware update

Firmware updates of the **MZ-8 HoTT** can be performed via the Data socket of the transmitter using a computer operating on Windows XP, Vista, 7, 8 or 10. You will also need an optional USB interface No. 7168.6, so as the optional adapter lead No. 7168.S. The programs and files required can be found in the Download area for the corresponding products at **www.graupner.de**.

Declaration of conformity



EXAMPLE

S3056 Speed controller Ultra Control 20A

Graupner/SJ declares that the product is conform to EU norms.

EMV 2004/108/EC: EN 61000-6-1; EN 61000-6-3

Notes on environmental protection



Disposal notes

This symbol on the product, user manual or packaging indicates that this product must not be disposed of with other household waste at the end of its life. It must be handed over to the applicable collection point for the recycling of electrical and electronic equipment.

The materials are recyclable as marked. By recycling, material reusing or other forms of scrap usage you are making an important contribution to environmental protection.

Batteries and accumulators must be removed from the device and disposed of at an appropriate collection point. Please inquire if necessary from the local authority for the appropriate disposal site.

Care and maintenance



Notes on care

The product does not need any maintenance, it works so as it is without any special care. In your own interests protect it from dust, dirt and moisture.

Warranty certificate

The Graupner, Henriettenstrasse 96, 73230 Kirchheim/Teck grants from the date of purchase of this product for a period of 24 months. The warranty applies only to the material or operational defects already existing when you purchased the item. Damage due to wear, overloading, incorrect accessories or improper handling are excluded from the guarantee. The legal rights and claims are not affected by this guarantee. Please check exactly defects before a claim or send the product, because we have to ask you to pay shipping costs if the item is free from defects.

The present construction or user manual is for informational purposes only and may be changed without prior notice. The current version can be found on the Internet at www.graupner.de on the product page. Moreover, the company **Graupner/SJ** has no responsibility or liability for any errors or inaccuracies that may appear in construction or operation manuals.

No liability can be accepted for printing errors.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Statement:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

