EN

Manual

mc-32 EX

32 channel 2.4 GHz radio control transmitter

No. 33040

CE

Graupner

Index

Introduction

Thank you for choosing a ***Graupner mc-32ex HoTT*** transmitter.

Read these instructions carefully to get the most out of your new transmitter and to control your models safely. This guide is NOT intended as a programming guide for the transmitter, since as a printed guide it could only ever be a snapshot of the transmitter's firmware current at the time of printing.

So if any difficulties should arise when programming the transmitter or operating the model, consult the context-related online help for the transmitter or ask your dealer or the ***Graupner*** Service Center.

Due to technical changes, the information contained in this manual can be changed without prior notice. In order to keep the product and the firmware up to date, activate the „Resource update" option at regular intervals as part of a firmware update or find out more on the Internet at:

www.graupner.com

This product meets the legal national and European requirements.

In order to maintain this condition and to ensure safe operation, you as a user must read these instructions and the safety instructions before commissioning the product and also observe them during later operation!

Note

These instructions are part of the product. It contains important information on commissioning and handling. You should therefore keep the instructions for future reference and pass them on to third parties if the product is passed on.

Service center

Graupner Service Center Deutschland UG (Europe)
Süd-Nord-Strasse 63
D-26907 Walchum

Telefon: +49 (0)5939 959 919 0
Email: service@graupner-service.de
Internet: www.graupner-service.de

Graupner online

You can find the addresses of other service centers on the Internet at:
www.graupner.com

Intended Use

This remote control system may only be used for the purpose intended by the manufacturer, for the operation of unmanned remote control models. This includes all types of UAVs or all types unmanned aerial vehicles as well as all types of unmanned land and water vehicles. Any other use is not permitted to be the cause of significant property damage and/or personal injury. Therefore, no guarantee or liability is assumed for any improper handling outside of this provision.

Furthermore, it is explicitly pointed out that you must comprehend the laws and other regulations applicable at the location of activities before you start remote control operation. Such requirements may be varied from state to state. Wherever, these must be followed in any case.

Notes

- An overview of the legal provisions currently applicable in Germany for the operation of „unmanned aerial vehicles" can be found on website at **https://www.bmvi.de/SharedDocs/DE/Anlage/LF/drohnen-flyer-regelungen-eu-und-deutschland.html** or after entering the search words "drones" in the search box on **www.bmvi.de**.
- Airfields, factory premises, nature reserves, built-up areas, etc. are not generally allowed to fly over.
- The "AirMap for drones" or "AirMap" app available in the Apple or Google store can be used to find out where the designated no-fly zones are and where flying is therefore prohibited under any circumstances.

Read the entire manual carefully before using the transmitter.

Target group

The product is not a toy. It is not suitable for children under the age of 14. The transmitter may only be operated by experienced modelers. If you don't have sufficient knowledge about handling radio-controlled models, contact an experienced modeler or a model club.

Package content

- Radio control transmitter 33040 ***Graupner mc-32ex HoTT***
- USB-cable
- USB-Adapter for receiver and sensor updates
- 1S3P LiHV transmitter battery with 9000 mAh
- Transmitter strap
- Aluminum case
- Radio control transmitter manual

Note

Graupner is constantly working on the further development of all products. We therefore reserve the right to change the scope of delivery in terms of form, technology and equipment.

Technical Data

Radio Control transmitter *Graupner mc-32ex HoTT*

Frequency band	2.4 ... 2.4835 GHz
Modulation	2.4 ... 2.4835 GHz
Transmitting power	100 mW EIRP
Control functions	32 functions of which 8 can be trimmed 64 switch functions
Temperature range	-10 ... +55 °C
Antenna	1 linear and 1 circula polarized, with adjustable angle, integrated antenna
Operating voltage	3.6 ... 4.35 V
Current consumption	500 ... 1200 mA
Dimensions	Approx. 275 x 260 x 115 mm without hand rests
Weight	Approx. 1700 g with battery

Note

The technical data of optional receivers can be found in related receiver system manual.

WLAN

Frequency band	2.4 ... 2.4835 GHz
Modulation	IEEE 802.11b: DSSS (CCK, DQPSK, DBSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK); IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK, BPSK)
Channels	11
Antenna	Omni with 3.0 dBi gain

Bluetooth® 3.0+EDR

Frequency band	2.4 ... 2.4835 GHz
Modulation	GFSK, Pi/4 DQPSK, 8DPSK
Channels	79
Antenna	Chip anteanna with 0 dBi gain

Symbol Description

Keep an eye on the information marked with this warning sign, especially which are additionally marked with **CAUTION** or **WARNING**. The signal word **WARNING** indicates possible serious injuries, another word **CAUTION** indicates possible minor injuries.

Note Signal word for potential malfunction.

Attention indicates potential damages to objects.

Safety notes

These safety instructions are intended not only to protect the product, but also to ensure your own safety as well as other people's. Therefore, read this section very carefully before you use the product!

- **Do not leave the packaging material lying around, it could become a dangerous toy for children.**
- **Persons, including children, who due to their physical, sensory or mental abilities or inexperience or ignorance are unable to operate the transmitter safely, must not use the transmitter without supervision or instruction from a responsible person.**
- **The handling and operation of radio-controlled models needs to be learned! If you have never piloted such a model, start out very carefully and familiarize yourself with how the model responds to remote control commands. Proceed with responsibilities.**
- **Protect all devices from dust, dirt and moisture. Never expose them to vibration or excessive heat or cold. Remote control operation may only be carried out at „normal" outside temperatures in range from -10 °C to +55 °C.**
- **Always perform a range and function test on the ground before you start using your model! This is the only way to ensure safe operation!**
- **Always use all of your HoTT components with the latest firmware version.**
- **In case of questions that cannot be clarified with the help of the operating instructions or the context-related help text, please contact us or another specialist.**

For your safety when handling the transmitter

WARNING

- **While programming the transmitter, make sure that a motor connected to the model does not start up by accident. Disconnect the fuel supply or the drive battery beforehand.**
- **Never program your transmitter during normal operation of model. This can result in inattentiveness when controlling as well as incorrect programming.**

CAUTION

Avoid any kind of short circuits in all connection sockets of the transmitter and receiver, which can result in risk of fire! Only use the correct connectors. Do not make any modifications to the electronic components of the transmitter or receiver. Any interference will void the warranty.

Note

Protect the model and the transmitter from damage during-transport.

For your safety when handling batteries

CAUTION

- **Protect all devices from dust, dirt, moisture, heat and vibration. Only use in dry conditions.**
- **Do not use any damaged battery.**
- **Any alterations to the battery can result in serious injury or burns.**
- **Batteries may not be heated, burned, short-circuited or charged with excessive current or reversed polarity.**
- **Combustible or highily inflammable objects are to be kept away from the charging area.**
- **Never leave the charger unattended when it is connected to the power supply.**
- **Please charge batteries in rooms equipped with a smoke detector.**
- **Always charge batteries with suitable chargers.**
- **The max. quick charging current specified for the respective cell type must not be exceeded.**

- **If batteries heat up above 60 °C while being charged, stop charging and let the batteries cool down to approx. 30 ... 40 °C.**
- **Never re-charge batteries that have been charged or hot batteries. If a cell of the battery pack has become particularly hot after quick-charge process, this may indicate a defect in that cell. Do not use this battery pack anymore!**
- **No modifications to batteries. Never solder or weld the cells personally.**
- **If handled improperly, there is a danger of fire, explosion, irritation and burns.**

Special instructions

- Only use charging/discharging devices specially designed for charging and discharging rechargeable batteries.

Safety instructions for storing batteries

- Batteries should be stored in dry rooms at an ambient temperature of +5 °C to +25 °C.
- LiPo batteries are to be stored for a longer period of time, their cell voltage should be kept approx. 3.8 V. If the cell voltage drops below 3 V, they must be recharged immediately. Deep discharge makes the battery short-term. Longer storage in discharged as well as fully charged state make the battery useless in the long term.

Transmitter description

Front side of the transmitter

1	Display
2	Directional buttons to scroll through menu pages
3	Direct access to the servo view
4	Direct access to „Setting & Data View“ / „Model List“
5	Back button / Menu button
6	Joystick trim button
7	left stick
8	middle slider board SL1 ... SL3
9	right stick
10	Digital button DT5 + DT6
11	left and right switch board
12	left and right lever control LV1 + LV2
13	left and right rotary drum control TV1 + TV4
14	Telescopic rotary control TV2 + TV3
15	Rotary drum control UV1
16	Speaker
17	Eyelet for mobile phone holder or carrying strap
18	Power Switch
19	Antenna
20	***Graupner*** Logo with integrated RF status LED

Back side of the transmitter

Open the transmitter

Before opening the transmitter, switch it off by sliding the power switch to the right.

To open the transmitter, push both locks on the bottom of the housing towards the front side of the transmitter as far as they go. Then open the bottom of the case and unhook it.

CAUTION

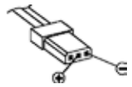
- To open the transmitter, place it on your lap preferably with the hand rests or on two stably high supports of suitable material for the stick units together with their toggle switches, neither to load excessive pressure nor to cause damage.
- Before starting any work inside the transmitter, disconnect the transmitter battery by unplugging the connecting cable to avoid short-circuits!
- No modifications to the transmitter. Otherwise the warranty and approval will be void!
- Never touch and contacts circuit boards with metal objects or your fingers.

Removing the transmitter battery

Lift the battery from the side and pull it off the Velcro strip. If necessary, hold the battery box, not the transmitter, to avoid damaging the inside of the transmitter. Then, pull off the plugs of the two connecting cables to the transmitter battery by pulling out the supply cable carefully.

Insert and connect the transmitter battery

As shown on the left, place the battery in the compartment and then insert the plugs of the two connecting cables into the sockets on the edge of the battery box without exertion. The two battery connections are structurally protected against polarity reversal, which is why the direction of either inserted battery plugs is not designated mechanically or by polarity information. The only thing to note is that + line, usually a red cable, must be plugged into the middle pin and the - line, usually a brown or black cable, be plugged into one of the two side pins of each socket.

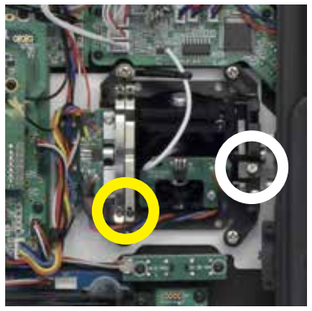


Switching the control sticks

Note

Structually identical sticks to be installed on the opposite side by turning 180 °.

Neutralizing



Both sticks on the left and right side to be switched from neutralizing to non-neutralizing optionally.

To change the standard setting of stick, find out the screw in white-circle of the left photo. This screw must be turned in until the control stick in problem can be moved freely between the stops, or turned out until the control stick is completely selfreset again.

Note

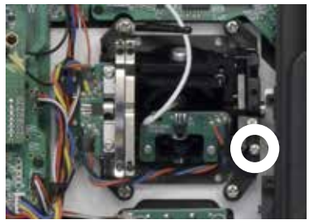
Which of the two sticks is to be switched to nonneutralizing depends on the choice of the control mode.

See below under „Transmitter preparation“ on page 22.

Brake spring and ratchet

The braking force can be adjusted with the outer of the two screws in yellow circle of the left photo and the ratchet strength of each stick can be adjusted with the inner one.

Control stick restoring force



Restoring force of back and forth direction can be adjusted by pilots' practices.

The adjustment system is located next to the return springs, see the screw in white-circle on the left photo. With phillips screw turning, the spring can be adjusted to the required level of strength:

By turning respective adjustment the screw with a (cross) slotted screwdriver, the desired spring force can be adjusted:

- Truning to the right = harder reset force
- Turning to the left = softer reset force

Closing the transmitter

To close the transmitter, firstly fit the front housing into the bottom housing, then close-lock the bottom, making sure that no cables are pinched when closing the bottom.

Lastly, push both slides outwards to the end.

Connections and fixtures

Smartphone holder and transmitter strap

There is an eyelet on the top of the transmitter for smartphone holder or strap to carry.

Bracket for transmitter strap

The ***Graupner mc-32ex HoTT*** is equipped with a foldable transmitter holder for shoulder strap. To fold out the fixed brackets, first press the two brackets in lettered spots slightly toward the transmitter to unlock the mechanism and then turn them upwards by approx. 90°. In this position, the brackets lock automatically. Now, the supplied strap to carry can be attached.

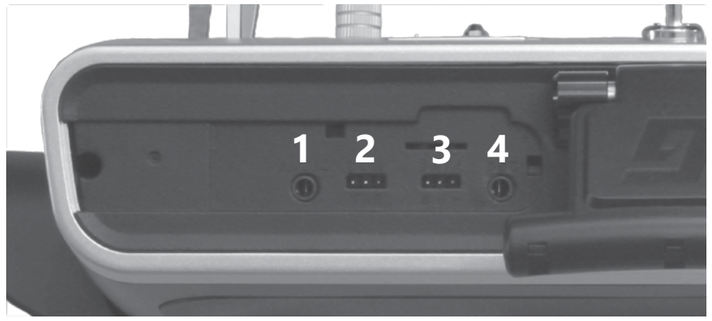
To close the bracket, first detach the carrying strap and then unlock on the right fixed bracket by pressing softly and then fold the bracket down. Then proceed in the same way with the left bracket.

Finally, both brackets must be pressed back into the recess at the same time into the recess.

Note

Never carry the transmitter with only one carrying handle, this overloads the mechanics.

Connection panel under the left upper flap with ***Graupner***-logo on front



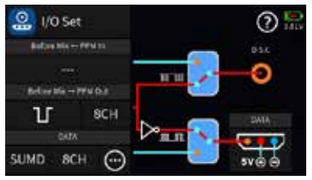
1	DSC-Connection
2	DATA-Connection
3	COM/TRG-Connection (**T**=Transmitter, **R**=Receive, **G**=Ground)
4	AUDIO-Connection

DSC-Connection

With DSC cable, this port can be used for a simulator or teacher/ student mode.

Note

Graupner recommends to operate simulators mainly with wireless transmission technology or in joystick mode through the USB-C connection.

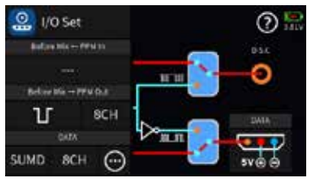


If necessary, switch to the required DSC operating mode in the "I/O Set"-submenu of the system menu.

To ensure correct DSC connection, keep the following

1. *Make necessary set-ups in the menus.*
2. *Connect one end of the DSC cable into the DSC socket of the switched-off transmitter and the other end into the device to be connected.*
3. *Turn on your devices.*

DATA-Connection



The DATA connection is used to connect SUMD-enabled devices like a smart box or other peripheral devices such as Crossfire or ELRS transmitter modules, ext. Bluetooth modules, etc. More detailed information can be found in the help texts of the "RF Set" submenus of the basic menu and "I/O Set" of the system menu. The corresponding settings are also to be made in this submenus.

COM/TRG-Connection

Interface for connecting external serial devices, f.e.; use the PC software Data Explorer for the live logging function on a PC.

AUDIO-Connection

As soon as a headphone is connected, the speaker built into the transmitter is muted and the acoustic signals and voice announcements of the transmitter are output via the headphone.

The volume is adjustable in the „Volume" submenu of the „System" menu.

Connection panel under the right upper flap with the **MC-32**-logo on front

5	USB C-connection: Charging the transmitter battery and connecting the transmitter to PC or laptop computer

USB C-Connection

Note

Preferably use the USB-A to USB-C cable included in the set especially in case of charging problems with your equipment. It may also help to attach a standard USB-A (socket) to USB-C (plug) adapter to the supplied charging cable.

Charging the transmitter battery

- **when the transmitter is switched off**

  As soon as the transmitter is connected to a suitable USB power source, the charging process begins.

  Depending on the charging state of the transmitter battery, LED right of the power switch flashes every 2 seconds in different colors with frequencies. It means:

  1x red = Charging state <10 %
  2x red = Charging state between approx. 10 and 20%
  3x red = Charging state between approx. 20 and 30%
  4x red = Charging state between approx. 30 and 40%
  5x red = Charging state between approx. 40 and 50%
  1x green = Charging state between approx. 50 and 60%
  2x green = Charging state between approx. 60 and 70%
  3x green = Charging state between approx. 70 and 80%

4x green = Charging state between approx. 80 and 90%

5x green = Charging state between approx. 90 and 99%

Konstant green = the battery is fully charged.

Thus, the loading process is completed.

- **when the transmitter is switched on**

  Charging process starts with the transmitter connected to a suitable USB power source and ends with the cable unplugged or with the battery fully-charged.

  When the loading process begins, the current display will be automatically switched to the left one in a short time. Tapping one of the other connection types also activates it.

  By tapping the „USB“ symbol on the left top, you can exit from the menu again.

  The ***Graupner mc-32ex HoTT*** transmitter can be used “normally” during the charging process. Red flash of the battery symbol on the upper right corner of the display shows on-going process of charging.

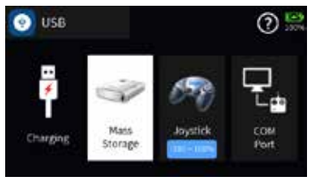
WARNING

The transmitter should be charged under supervision and in rooms with a smoke detector.

Mass storage memory

If the ***Graupner mc-32ex HoTT*** transmitter is connected to a compatible PC and the „Mass memory“ field is activated by tapping it, the transmitter‘s memory can be accessed from PC. For example, to copy screenshots or model data from the transmitter to the PC or vice versa, or to load MP3 or update files onto the transmitter, or to delete files from the transmitter that are no longer required, etc.

Activate mass storage step-by-step

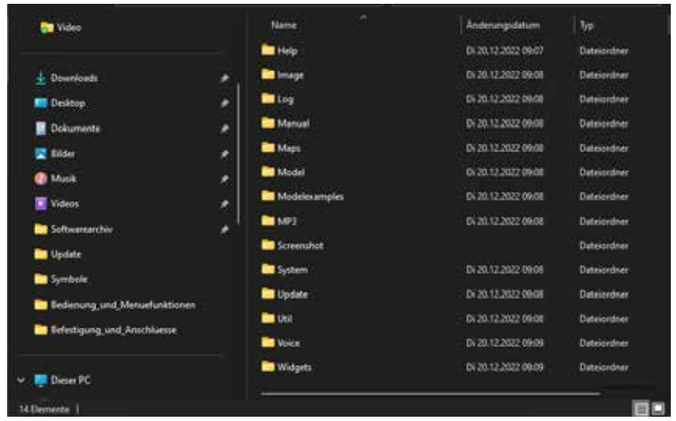


1. *Connect the transmitter to laptop computer or PC using the provided USB C cable.*
2. *Convert to „blue“ system menu, if needed.*
3. *Tap „USB“ menu item, if needed.*

   The USB menu shown on the left opens.
4. *Tap the mass storage icon.*

   The symbol and its designation are shown inversely.
5. *On laptop computer or PC, open the file explorer and look for a „mc-32“ drive.*

6. *Double-click on the drive to open the file structure of the transmitter‘s mass memory:*

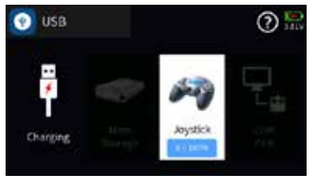


7. *Now the desired folder can be accessed.*

Note

Even if the transmitter can no longer be switched on, the mass memory can still be accessed especially, see „Forced starting in USB mode mass memory step-by-step“ in the „Firmware update“ section.

Joystick



Once the transmitter is connected to PC via the transmitter‘s USB C port and „JOYSTICK“ is selected by tapping it, the connected PC will recognize the transmitter as a joystick.

The default setting suitable for most flight simulators is „0% to 100%“. Microsoft‘s Flight Simulator 2020 should be operated with the setting „-100 ~ +100%“.

COM Port

Interface for connecting external serial devices

Transmitter preparation

Sticks

As described under „Switching the control sticks“ on page 16 in the section „Back of the transmitter“, their neutralization, braking force and ratcheting ratchet effect as well as their restoring force must be customize to the pilot's habit.

Notes

- Due to the three-position switches integrated with both sticks, the length of the sticks is NOT adjustable.
- Which of the two sticks is to be switched to non neutralizing also depends on the selection of the control mode, see below under „Starting up the transmitter“.

Inserting the battery

Note

When connecting the battery, make sure that the contact is completed. Interruptions to the power supply to the transmitter in model operation can become a serious hazard to yourself and others.

See „Insert and connect the transmitter battery“ on page 16 in the “Transmitter back” section for more information.

Charge the battery

The transmitter battery is charged via USB C socket in front of the transmitter under the flap of mc-32-logo. See „Charging the transmitter battery“ on page 19“ in the “USB C Connection” section for more information.

Low voltage warning

The supply voltage of the transmitter must be monitored during operation. If the capacity fall below an adjustable limit, 20% of default, a corresponding warning sounds continuously.

At this point, model operation must be stopped immediately and the transmitter battery is to be charged or replaced!

Attention

As soon as the supply voltage of the transmitter fall below 3.6 V, the transmitter switches off automatically without any-further warning.

Battery operating time

The operating time of the battery is added up with each use. The clock is reset to the value „0:00“ when the battery is charged or replaced. However, this only happens if the battery voltage is noticeably higher than before. As a default, the battery operating timer, like the model operating timer, can be found in the „Clock Info“ submenu of the basic menu. However, each of these two clocks is also available as a widget for insertion into an individualized main menu.

Antenna alignment

In model operation, the surface of the antenna should be aligned towards the model roughly.

Transmitter Commissioning

Turn on the transmitter

Sliding the power switch to the left turns on the ***mc-32ex HoTT*** transmitter.

Initial setup of the transmitter

If the transmitter is still in delivery status or if it was previously reset to the factory settings in the „Info & Update“ menu, an almost self-explanatory wizard starts immediately after switching on the transmitter.

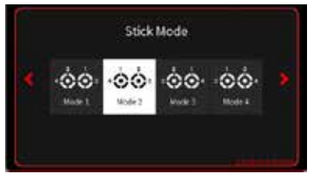
The questions of the first four displays can be answered by tapping on the selection field that you want.

Tapping the symbol „>“ at the right side of the dispaly switches to the next display and tapping the symbol („<“) at the left side switches backward to the last display.

Control modes

- (Airplane models)

MODE 1 (Throttle right)	MODE 2 (Throttle left)
Elevator, Rudder, Full throttle, Querruder, Motor idle	Full throttle, Elevator, Rudder, Aileron, Motor idle
MODE 3 (Throttle right)	**MODE 4 (Throttle left)**
Elevator, Aileron, Full throttle, Rudder, Motor idle	Full throttle, Elevator, Aileron, Rudder, Motor idle



- (Helicopter model)

MODE 1 (Throttle right)	MODE 2 (Throttle left)
Nick / Motor / Pitch / Tail rotor / Roll	Motor / Pitch / Nick / Tail rotor / Roll
MODE 3 (Throttle right)	**MODE 4 (Throttle left)**
Nick / Motor / Pitch / Roll / Tail rotor	Motor / Pitch / Nick / Roll / Tail rotor

- (Copter)

MODE 1 (Throttle/Pitch right)	MODE 2 (Throttle/Pitch left)
Nick / Throttle/Pitch / Yaw / Roll	Throttle/Pitch / Nick / Yaw / Roll
MODE 3 (Throttle/Pitch right)	**MODE 4 (Throttle/Pitch left)**
Nick / Throttle/Pitch / Roll / Yaw	Throttle/Pitch / Nick / Roll / Yaw

- (vehicles and boats)

Note

To be compatibile with control modes of the flying model types, we recommend to assign control function 1 for the backwards and forwards function and control function 4 for the direction function:

MODE 1 (for/backward right)	MODE 2 (for/backward left)
forward/backward / left / right / forward/backward	forward/backward / left / right / forward/backward
MODE 3 (for/backward right)	**MODE 4 (for/backward left)**
forward/backward / left / right / forward/backward	forward/backward / left / right / forward/backward

Notes

- The control mode selected during setup is saved as a default for models to be set up and can be changed at any time in „Stick Mode Preset" option of the "System Set" sub-menu of the System menu.
- Within a model memory, the control mode can be adapted to individual needs at any time in the last value field of the „Model type" submenu of the basic menu.
- Depending on the selection of a control mode, one of the two control sticks may also have to be switched to non neutralizing, see above under "Neutralizing the control sticks".
- Not only the presetting of the control mode but also the language setting can be adapted to current needs at any time, in the „System Set" submenu of the system menu as well as the date and time in the „Clock Info" submenu of the basic menu.

Date time

IThe current date and time are entered or corrected in this display as part of the initial setup of the transmitter.

Set date and time step-by-step

1. *Touch the desired value field.*
   This is displayed in white and selection fields are found at the bottom of the display.
2. *Use the left „⌄"- or central „⌃"-button to select the desired value.*
3. *If necessary, proceed in the same way with the other value fields.*
4. *Tapping the right tick closes the current display and converts to the next, last one.*
5. *Tapping „❯" restarts the transmitter and after the start-up display, the factory pre-configured first display page appears.*

Main display

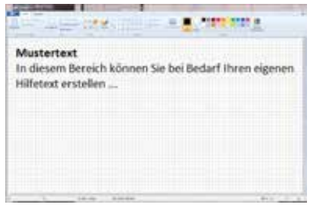
This display, like five others, is completely freely configurable except header. The context-related help text explains how this is done in detail.

A total six free-editable pages can be selected by top two buttons on the left of the display or by the left or right arrow keys.

Online help

This can be called up at any time in the main display as well as in most other menu positions by touching the question mark symbol (?) at the top right of the display. If necessary, you can also create such help pages yourself and save them in the appropriate directory.

The pixel editor „Paint" included as standard in Windows installations is suitable for creating your own help page. For example, you can also download the Paint 3D program for Windows 11 PCs from the Microsoft Store for free.



In Paint, Paint 3D or other pixel editors, create a new page in landscape format with 440 x 232 pixels. After filling it with any content, save it under „Save as" as a „BMP image" and with the file type „24-bit bitmap (*.bmp; *.dib)". In Paint 3D, select „Other" under „Save as file" and then select „2D bitmap (*.bmp)" as the save format. The corresponding sub-directory of the „Help" directory of the transmitter is to be used as the storage location and the next free three-digit number followed by an underscore (123_xyz.bmp) is to be placed in front of any file name.

Notes

- The help texts and PDF files in DIN A4 format (created on the basis of the help texts and located in the „Manual" directory), are regularly adapted to the current software version. As part of resource, updates is to be offered with download fit to the firmware update of each current version.
- The entire content of the online help can be found in the current version on the station-specific download pages.

Turn off the transmitter

Slide the transmitter power switch to the right. The security query shown on the left is displayed:

- Tapping „back" or sliding the power switch to the left again within 4 seconds cancels the shutdown process.
- Tapping "Don't Save" within 4 seconds will turn off the transmitter WITHOUT saving any changes to the model memory and/or global settings.
- Tapping "Save" within 4 seconds will turn off the transmitter after saving the model memory and/or global settings.
- Alternatively, the transmitter switches off automatically about 4 seconds after you slide the power switch to the right and then also saves the model memory and/or the global settings.

Operation and menu functions

Buttons to the left of the display

Refer selection button to „upper", „middle" and „lower" as follows:

upper

- scroll up or left
- In the „Model List" menu, page-by-page change to the top.
- Scroll back from online help pages and, if necessary, close the online help.
- Closing widget pages opened unintentionally during model operation.

middle

- Scroll down or right in menus
- In the „Model List" menu, page-by-page change down.
- scroll forward from online help pages

lower

- Scroll left and right in menus
- Confirm any choice of model made in the „Model list" menu.
- Switching on the HF after a restart or model change in the „HF ON/OFF" window.
- Skip to the first page of activated online help pages.
- **Log-Function**
  - Pressing the lower left button for about one second will turn the transmitter's log function ON or OFF by default.
  - This toggle function of the lower button is disabled as soon as and as long as a switch is assigned to the "Log Type/ Save" option in the "System Config." menu of the System menu. This switch switches the log function on and off only if RF is active.
  - The respective log files can be found in the \\Log\»Model name« folders and can be read out with the „File Log Viewer" included in the „Firmware Upgrade grStudio" PC program.
  - Also recommended for the evaluation of the log files is the DataExplorer, which can be found under ...

    https://www.nongnu.org/dataexplorer/download

Buttons to the right of the display

upper

- Change between „Servo view" and last active menu position.
- In the „Model List" each keystroke moves up one line.
  - In case of the white bar at the top of the first model, the selection of the model types displayed at the top edge of

the display is switched whenever the top button is pressed again.

middle ○

- With „HF ON“ and an existing telemetry connection, switch to the „Settings & Displays“ submenu.
- In the case of „HF OFF“ or an interrupted telemetry connection, switch to the „Model List“.
- In the „Model List“ each keystroke moves down one line.

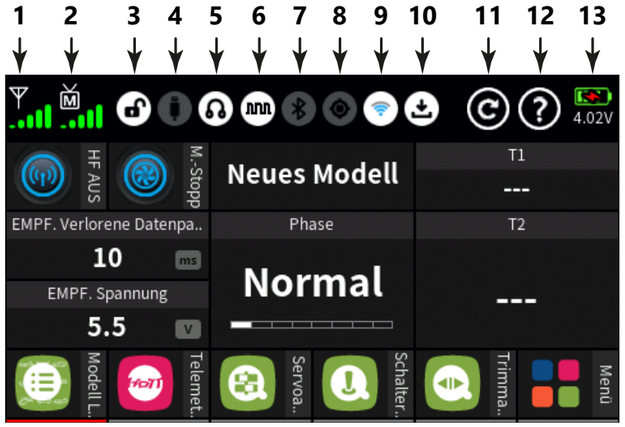
lower ⊞

Change between „basic display“ and last active menu item.

Press any of these six keys

Cancellation of the time-controlled switch-off of the lighting that may have been activated in the „Backlight“ line of the „Display“ menu in the „System menus“.

Symbols of the main display



1	Transmitter RF status
2	Receiver RF status
3	Screen lock on/off
4	USB port connected/not connected
5	Headphones connected/not connected
6	DSC cable connected/not connected
7	Bluetooth connection on/off
8	GPS signal available/not available (display only with built-in GPS module)

9	WiFi ON/OFF
10	Data logging on/off if RF is active
11	reset button
12	help button
13	Battery status, tap to toggle between % or volts

Note

All other indications on the display are interchangeable and are stored model-specifically.

Operation of the display

The operation of the display is similar to the operation of other touch-sensitive dispalys, by tapping the desired option with the fingertip or with a pen suitable for capacitive displays. The only exceptions are the status of the six freely configurable indicators on main displays, which are outlined in red top left.

Note

Do not press-wise tap on the display when the transmitter is on separate surface, e.g. on a wooden table. The fingertip wide print surface on the screen can result in unresponsive play of the screen.

- Touching the „Menu“ field at the bottom right of the main display switches to the last active of the four tabs or menu lists labeled „Basic“, „Function“, „Special“ and „System“, as shown on left photo.

  The fifth tab, the one marked with the house symbol and “Home” leads back to the main display.
- Tapping on a tab switches to the corresponding menu list.
- Tapping on a menu opens the corresponding menu, for example the „Model type“ of submenu.

The composition of the desired model type follows the same practice. If you have question, the context-related help, which can be called up via the symbol ?, always is be useful.

change the current control mode

The control mode in initial setup of the transmitter has been stored as default in the „System Set“ menu of the system menu and is automatically adopted in all model memories to be reinitialized in the future.

Completely independent of this specification, the control mode can be individually adjusted at any time for both new and existing model memories. To do this, switch to the end of the selection list in the „Model type" submenu by swiping the selection list to the left with one finger or by pressing the lower left button.

Change control mode individually step-by-step

1. *If necessary, switch to the „green" tab of the „Basic" menu.*
2. *If necessary, touch the „Model type" field.*
3. *If necessary, swipe the model type selection to the left or press the lower left button to get to the end of the selection list.*
4. *Touch the „Control mode" field.*
   The „Control mode" selection window shown on the left is displayed.
5. *Select the desired control mode or touch „Back" to return to the previous screen without changing the control mode.*

Change control mode preset

Change default control mode step-by-step

1. *Switch to the „blue" tab of the system menus.*
2. *Tap the „System Set" field in the top left*
3. *The „Mode X" field located below the label „Control mod. Preset." in the middle of the lower edge of the display - to be touched until the desired control mode is visible repeatedly.*

Screen lock

In the basic display of the transmitter, the input lock of the screen is activated by pressing the two lower selection keys simultaneously for approx. 1 second.

- The key lock functions displayed by a lock symbol. The controls remain operational.
- Pushing the two lower selection buttons again for approx. 1second releases the lock.

Screenshot-Funktion

This option, in the „Display" menu of the „blue" system menu, is a practical aid not only when creating display images for this manual, but also, for example, for creating documentation on model settings and for passing on settings to other model pilots, etc.

Create model ...

Creating a new model step-by-step

1. *If necessary, switch to the „green" tab of the „Basic" menus.*
2. *Tap the „Model List" field in the top left.*
3. *Touch the model number in the „No." column.*
   A bar with symbols appears at the bottom edge of the display

4. *Tap the plus sign.*
   The display for entering the model name opens. For example „Airbus H145".
   Upper and lower case as well as numbers and special characters can be used

5. *After entering the model name and confirming it by tapping the button ↵ at the bottom right, the „New model" display opens with the model name created by you in the „Name" line, see the screenshot on the left.*

Define model type

Define model type step-by-step

1. *In the „New model" display, tap the model type symbol below the „Model type" field to select a different model type from the „Airplane" model type shown here as an example, the model type „helicopter".*
   After tapping the helicopter icon, the display will revert to the New Model screen with the helicopter icon under Model Type and the icon row options appropriate to the selected model type.

2. *Now define the desired model type based on the options offered.*
   In the case of the „helicopter" model type selected here as an example, these would be the options „swash plate type" and „throttle minimum front or rear". Further options become visible after moving the options bar to the left by swiping or pressing the lower button on the left of the display and can also be selected or left as it is, such as the control mode ... if the control mode is preset when setting up, the transmitter is the right one.
3. *Once the desired model type has been put together and given the appropriate model name, the blue "Create & select" button*

must be tapped to complete the process. The transmitter saves the changes and restarts with the model just created.

After restarting the transmitter, two security displays may appear one after another. In this case it can be typed easily because no model-specific settings have yet been made, apart from the model-type-specific basic settings.

Model specific settings

The other model-specific settings are to be made, whenever required, in various menus of the transmitter. The selection of setting options, in particular in the „orange" function menu, is based on the selected model type.

Detailed menu descriptions can be found in the context-sensitive help texts in almost every menu using the ⓘ. It can be accessed on the corresponding pages of the PDF files in the „Manual" folder of the transmitter.

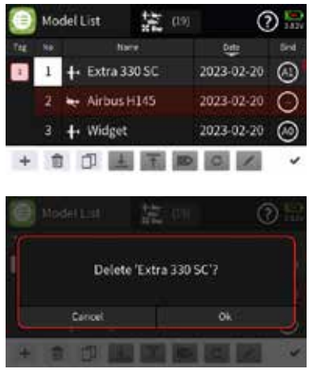
How to access this folder on laptop computer or PC can be found above, in the „Transmitter description" section under „USB C connection".

Rename model

Renaming a model step-by-step

1. *If needed, switch to the „green" tab of the basic menu.*
2. *Touch the „Model type" field at the top right.*
3. *Tap the box to the right of Name.*
   The display for entering the model name opens.
4. *Compose the model name from the offered characters.*
   Upper and lower case as well as numbers and special characters can be used.
5. *Accept the model name by tapping the symbol ↵ at the bottom right or cancel the process by tapping the "x" at the top right.*

Delete model



Delete model step-by-step

1. *If needed, switch to the „green" tab of the „Basic" menus.*
2. *Touch the „Model list" field at the top left.*
3. *Touch the model number of the model you want to delete in the No. column.*
4. *Tap the Trash icon.*
   A security query is displayed.
5. *Tapping OK confirms the process. Tapping „back" cancels the process.*

Note

The activated model memory cannot be deleted. It may be necessary to carry out a model change first.

Model selection

Select model step-by-step

1. *If needed, switch to the „green" tab of the „Basic" menus.*
2. *Touch the „Model list" field at the top left.*
   Limit the selection to a specific model type by tapping on the group of model symbols – in the middle of the top edge of the left image field.
3. *Search for the desired model in the list by swiping up or down or pressing the top or middle button on the left of the display and initiate the model change by touching the desired line.*

   Immediately after initiating the model change, the display on the left is shown.
4. *Tapping „Select" starts the model change. Tapping the icon cancels the process.*

Bind Receiver

To be able to establish a connection to the transmitter, the ***Graupner*** HoTT receivers have to be bound to at least one model memory of "their" ***Graupner*** HoTT transmitter. This process is usually referred to as "binding" and can be repeated at any time.

With the ***mc-32ex HoTT*** transmitter, this „binding" of a receiver always takes place as part of a so-called binding group whereby the next free group is always suggested automatically when binding a model memory. As long as this suggestion is always adopted, it is ensured that each model memory be in its own binding group. As a rule, a model-specific binding takes place.

The respective group membership is visualized e.g. in the „Binding" column on the right-hand side of the model list. See the screenshot on the left. Alternatively, a model memory can also be bound „universally" or as part of a specific binding group.

Bind Group

In the case of an unbound model memory, the next free binding group is preset as default after opening the menu. However, as long as the model memory is unbound, this default can be changed if required in the left value field of this option:

- „Global", i.e. transmitter-specific, bound receivers react to the signals of all globally bound model memories of „their" transmitter!
- „Group"-specific bound receivers only react to the signals of the model memory belonging to their binding group.
  - Without any action on the part of the user, a model memory is bound in the next free binding group.

    || *Model memories binded by this way only react to the signals of the explicitly assigned model memory. Unintended operation on model memory is NOT possible.*

  - If an occupied binding group is selected manually, for example because a receiver with the same ID has to be stored with the management as part of a competition, the binding is carried out with the ID of the selected binding group.

    || *Model memories linked by this way react to the signals of each model memory in the same group identifier. Unintended operation is excluded only from model memory in global binding or deviating group membership.*

Note

The respective group affiliation is displayed u. o. in the column "Bind" on the right-hand side of the "Model list" submenu.

Attention

If the left value field of the Binding group option is tapped in bound model memory with the RF switched off, all binding information of this model memory will be lost without further notice.

Basic procedure step by step

1. *Keep transmitter and receiver at a proper distance from each other.*
2. *Either switch on the **Graupner** **mc-32ex HoTT** transmitter without RF or set the RF module to „OFF" in the „Transmit RF" field of the „RF Config." menu.*
3. *Switch on the power supply of the receiving system.*
4. *Put the receiver in Bind mode according to its instructions.*
5. *On the screen, touch the desired value field „RX1 ... RX4" in the „Bind" column to trigger the binding process on the transmitter side.*

If the LED on the receiver signal correct connection according to its description and the receiver abbreviation appear in the value field of the relevant line „RX1 ... RX4", the binding process has been successfully completed. Otherwise, the positions of the devices may have to be changed and the entire procedure is to be repeated.

Note

As part of the binding process, the current firmware status of compatible receivers is saved in the transmitter and is displayed in the blue field below the receiver ID. Therefore the receiver must be rebound after each firmware update. Otherwise the firmware version display will not be updated.

Bind multiple recipients

The ***Graupner*** ***mc-32ex HoTT*** transmitter supports the binding of up to 4 ***Graupner*** receivers per model memory. Each of these receivers must be linked respectively and the last linked receiver is selected by ticking the appropriate box. "T. sel." is defined as the main recipient. See photo on the left. After all required receivers have been bound, this tick can be moved back to the line of the desired receiver by tapping on the corresponding value field, because only the telemetry data of the main receiver is evaluated. If necessary, all sensors should therefore also be connected to this receiver. However, if several ticks are ticked, the telemetry can be switched between the marked receivers via channel 16. For more information, see the help text in the „RF Set" menu.

As part of the maximum available number of channels, each of these maximum 4 receivers bound per model memory, always

starting with channel 1, is assigned the same control channels as standard. This assignment can be changed manually:

Adjust channel order

Set the order of channel to „consecutive" automatically

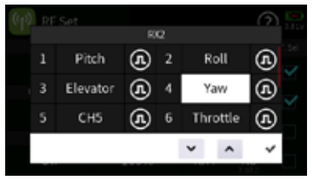
1. *Tap on the value field of the desired receiver in the „RX" column, for example receiver „E12" in the „Rx2" line. The „Channel Assignment" display appears, see left.*
2. *Tapping „Reset" sets the channel assignment as „continuous".*

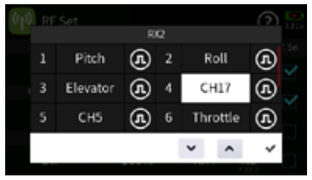
   || *In the example left on channels 17 ... 28, channels 1 ... 16 are covered by the 16-channel GR-32 HoTT receiver used as an example on Rx1.*

3. *Tapping "Reset" again sets the channel assignment back to the default order.*
4. *Tapping „OK" closes the „Channel assignment" display.*
5. *The same procedure may apply to other recipients.*
6. *If needed, the original definition of the main recipient can be changed by moving the checkmark in the „T. sel." to restore.*

Notes

- If the total of all channels on the receiver side exceeds the maximum of 32 channels of the transmitter, channel 32 is assigned to the “surplus” channels.
- The automatic assignment described above is only possible with compatible receivers. According to the current firmware status, these are all receivers whose firmware status is displayed below the receiver ID.





Adjust channel order manually step-by-step

1. *As described above, call up the „Channel assignment" display by touching the corresponding receiver identifier.*
2. *Tap on the channel assignment to be changed. The value field is displayed in reverse video and a control panel is displayed at the bottom edge of the display.*
3. *Select desired channel by tapping „⌄" or „⌃" button.*
4. *Tapping the check mark on the right edge of the control panel completes the process.*
5. *If needed, proceed in the same way with other channels.*
6. *Tapping "Reset" resets changed assignments to the default values.*
7. *Tapping „OK" completes the process.*

Delete Binding

Delete existing binding step-by-step

1. *With the receiving system switched off, switch on the **Graupner mc-32ex HoTT** transmitter without RF or, set the RF module to "OFF" in the "RF transmit" field of the "RF Set" menu*
2. *In the transmitter display, touch the desired value field „RX1 ... RX4" in the „Bind" column to trigger a binding process on the transmitter side.*

   The existing binding is deleted in the course of the binding attempt.

3. *Changing the bind group deletes all bindings.*

Range test

When the range test is triggered, the output power of the transmitter is significantly reduced. A practical function test can therefore be carried out at a distance of less than 100 m. After the end of the range test, the transmitter switches back to full output power and the range test signal tone stops.

If needed, ask a helper for support.

Range test step-by-step

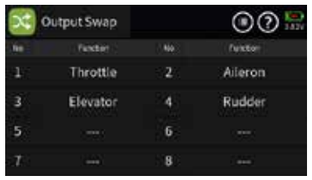
1. *Install the receiver, which is preferably already bound to the transmitter, ready for operation in the model.*
2. *Switch on the remote control and wait until the receiver signals a correct radio connection according to its instructions. It should now be possible to move connected servos.*
3. *Set up the model on level ground (pavement, short lawn or earth) so that the receiver antennas are at least 15 cm or about 6 inch above the ground. Therefore it may be necessary to underlay the model during the test.*
4. *Hold the transmitter at hip height and away from your body.*
5. *Make sure that no person(s) be between the transmitter and the model during the range test.*
6. *Start the range test in the „RF Set" submenu of the „green" basic menu by touching the value field.*
   - *The time display begins to run backwards and a signal tone sounds throughout the range test.*
   - *If, on the other hand, the message „Switch on RF first" is displayed, the RF module must be switched on at the transmitter end and the range test must be triggered again.*

7. *Within the specified duration, 99 seconds of the range test, move away from the model while moving the control sticks.*
   – *If there is an interruption in the connection at any time within a distance of approx. 50 m or 165 feet, try to reproduce it.*
8. *If needed, switch on an existing motor to check the interference immunity additionally.*
9. *Keep moving away from the model until perfect control is no longer possible.*
10. *At this point, wait for the end of the test period with the still operational model or tap the value field to end the test.*
    – *As soon as the range test is completed, the model should respond to control commands again. Do not use the system but contact the **Graupner** service center under imperfect condition.*
11. *Carry out the range test before each commissioning of a model and simulate all control movements that occur in practice. The range must always be at least 50 m or 165 feet on the ground to ensure safe model operation.*

CAUTION

Never start the range test on the transmitter during normal model operation.

Output swap



Since the transmission of the control channels to the receiver is optimized on the transmitter side, taking into account of the model-specific requirements and used channels, all required control channels/outputs must be assigned in the „Output swap" menu of the basic menu.

This assignment takes place automatically during the creation of a model memory and as a result of manual renaming of the required servo outputs in the „Servo settings" submenu of the basic menu.

Therefore control channels/outputs, that are used but have not been renamed, must either be assigned manually in this menu or the „Automatic assignment" display can be shown by tapping the symbol ☰ at the top edge of the display and then by tapping the blue field to trigger an automatic assignment.

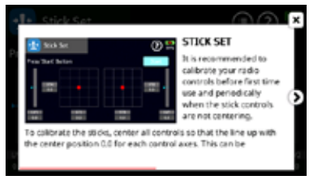
Stick Set

If the center position of the self-neutralizing joystick does not correspond to exactly 0% control travel, this can be corrected in this menu.

Check stick Set step-by-step

1. *Switch to the „Model list" submenu of the „green" basic menu.*
2. *Initialize a free model memory with any model type.*
3. *Do not make any further adjustments or adjust any trims.*
4. *Press the top button of the right keypad to bring up the Servo View menu: If all self-resetting sticks are in their middle position, the display of control channels 1...4 or 2...4, if the C1 stick is switched to non-self-resetting, should look like the figure on the left.*
   – *If the display looks as shown, everything is okay and the previously created model memory can be deleted again.*
   – *If the display deviates from the desired values, it can be calibrated in the "Stick calibration" submenu of the "blue" system menu.*

Stick Set step-by-step



1. *Leave the model memory enabled as previously created in "Check Stick Calibration Step-by-Step".*
2. *Switch to the „Blue" tab of the „System" menus.*
3. *Touch the Stick Set field.*
   The corresponding menu opens.
4. *Tap the symbol ? aat the top of the screen and perform the stick calibration following the help text instructions.*

Control Set

In depending on the selected model type, more or fewer mixing and other functions are activated in a newly created model memory, but are assigned and can be also operated on the model, only stick functions ST1 ... ST4, see figure on the left. This is not a mistake, but is due to the model pilot's choice and the individual model equipment. Additional control elements must be assigned as required and according to individual preferences. Shown as an example in the „Control Set" menu of the basic menu.

Control assignment step-by-step

1. *Open desired submenu.*
   Here is an example of the „Control Set" submenu of the „green" basic menu.
2. *In the desired line, touch the --- symbol in the „Control" column. Here as an example in the line of the control function „5". The display shown on the left will appear.*
3. *Now press the desired control element, for example the left slider on the middle board. The selection menu shown on the left opens:*
   - *In the left-hand column, the position of the control is indicated visually and the designation of the control is given below, here „SL1".*
   - *In the second column from the left, the current encoder position is visualized optically and numerically.*
   - *Tapping the box labeled „Reverse" reverses the direction of action. Visually recognizable in the right column.*
   - *After an encoder assignment, the symbol for the typical mode of action of the selected control is displayed in the „Type" column. In the example, the symbol for a proportional control or three-stage switch with an effective range from -100% to 0% to +100%.*
     By tapping on the symbol, you can choose between further types of effects in the rotation process:
     ... as before, but with a one-sided effective range of 0% ... 100%.
     ... like a jog or digital switch with a preset increment of 4%, which can be adjusted accordingly in the „Switch Set" menu.
     ... acts as an ON/OFF switch.
   - *In the right column, the result is visualized as a function of the path.*
   - *Tapping „OK" completes the process.*
   - *Tapping „back" cancels the process.*

Delete a Control

Tapping on the Control designation in the „Ctrl" column opens its configuration menu. Tapping on „delete" deletes the control assignment.

Note

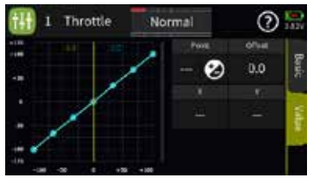
Further information can be found in the help text that appears after tapping the question mark at the top right.

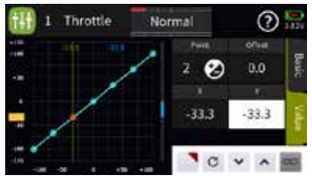
Set transmitter and mixer characteristics

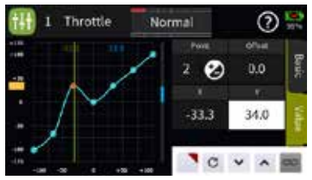
Both the control characteristics in the "Control Set" submenu of the "green" basic menu and the mixer characteristics of the various functions in the "orange" menu are essentially set according to the same principles. The corresponding procedure is shown below using the gas curve. However, the settings shown are purely for demonstrative purposes and in no way correspond to real gas characteristics!

Select characteristic step-by-step

1. *Open desired submenu.*
   Here is an example of the "Control Set" submenu.
2. *In the desired line, tap the symbol ... in the „Detail" column. Here is an example of the „Throttle" control function. The display shown on the left will appear.*
3. *Touch the „Curve" field at the bottom of the screen. Select the desired characteristic curve using rotation method, whereby the following information on the „desired characteristic curve" refers to the blue characteristic curve in the left display and not to the representation in the symbol.*
   You can choose from:
   - *A linear characteristic with no points between the two end points.*
     This characteristic corresponds to the standard setting.
   - *A linear characteristic with 5 points evenly distributed between the end points.*
     This characteristic is to be selected as the basis for nonlinear characteristics.
   - *A flat curve with a single point in the center of the control.*
     The horizontal characteristic can only be shifted vertically and can therefore be used, f. e. as basis for speed specifications for speed controllers.
4. *If needed, at the bottom right, in the field under „smoothed", select whether the characteristic should be „angular" or „rounded".*







Setting the curve characteristic step-by-step

1. *Switch to the „Value" display page.*
2. *Bring the vertical green line to the desired point with the relevant control, in the example with the throttle control stick.*

   The point approached is shown in red.

   The number of the point and the symbol for setting or deleting a point are displayed on the right of the graphic.

   Its coordinates are displayed below it, as well as a yellow rectangle at the bottom or left edge of the display, depending on the active coordinate field, and a control panel at the bottom right of the display.
3. *The selected point can now be moved either horizontally or vertically, namely ...*

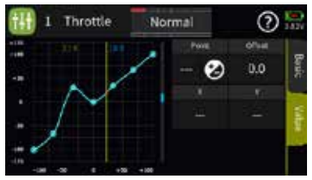
   ... either by tapping the icons in steps of 0,1 %.

   ... or by moving the horizontally or vertically relevant orange rectangle with a fingertip or a stylus suitable for touch screens.

   – *Tapping the icon resets the value of the selected row back to the default.*

   – *Tapping the symbol activates „Direct setting" further settings of this option are to be made in the menu of the same name of the „orange" function menu*

Add a point step-by-step



1. *Use the relevant encoder to move the vertical green line between two points.*

   As soon as „---" are visible to the left of the icon , another point can be set by tapping on the icon . Up to three more points are possible.
2. *If needed, adjust the position of the added point as described above.*
3. *Proceed in the same way with other points.*

Delete point step-by-step

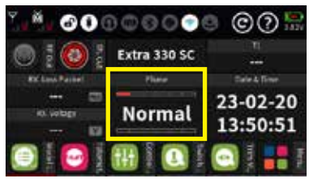
1. *Use the appropriate encoder to move the vertical green line to the point you want to delete.*

   The selected point is displayed in red and the number of the point is displayed to the left of the icon below „Point".
2. *Tapping the icon deletes the selected point. In the figure on the left that would be e.g. Point 3.*
3. *Proceed in the same way with other points.*

Note

As soon as a point is added or deleted, the points are automatically recounted from left to right.

Phase Set



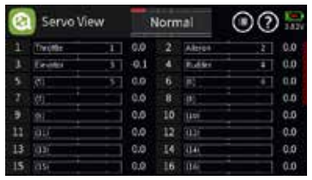
During model operation, settings and/or trim positions adapted to specific operating conditions are often required. In the case of airplanes, for example, this can also be understood outside of model flight using terms such as "takeoff phase", "normal flight phase" and "landing phase" or "hovering phase" for helicopters, etc. This is implemented in the ***Graupner***-world as "phase", called up by switches and each "phase" is a variant of basic settings of certain menus. (Maybe known as „Level" from other RC systems.) Recognizable in most menus by a column heading or field designation „Group" and the associated selection option between the icons and .

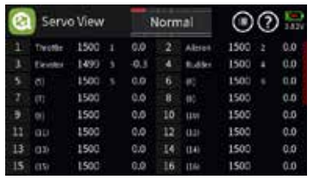
The icon stands for „global", i.e. the relevant settings are valid for all phases that may be active and the icon for „phase-specific", i.e. the respective settings are only valid in the currently activated phase.

Which phase is currently active can be seen not only in the basic display, but also at the top of all menus affected by the changing phase name in the course of switching between phases, see exemplary illustrations on the left.

- As long as no other phases are programmed and these switches are assigned, the transmitter is automatically in phase 1 „Normal".
- A maximum of 12 phases are possible.
- If an option is changed from „global" to „phase-specific", the originally „global" setting is applied to all activated „phases" and can then be individually adjusted in each active phase.
- If an option is changed from „phase-specific" to „global", the settings of that phase in which the change was made apply „globally" after the change.
- Details on the respective setting options can be found in the context-related help texts in the respective menus.

Servo View





The graphical representation of the current servo positions can be called up at any time directly from the basic display of the transmitter as well as from almost all menu items by pressing the top right selection button.

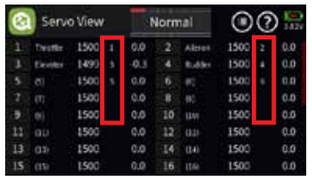
The current position of each servo is shown in a bar chart, taking into account all encoder and servo settings, the dual rate/ expo functions, the interaction of all active mixers, etc., between -150% and +150% of the normal path or displayed numerically in milliseconds. You can switch between the two display modes by tapping on the display.

0% or 1500 ms corresponds exactly to the servo center position.

You can switch between the display of servos 1 ... 16 and 17 ... 32 by swiping up or down or by pressing the left middle or upper selection button.

Notes

- The servo view only refers to the original order of the servos! This does not follow either an exchange of the outputs made directly in the receiver in the „Assign output“ submenu of the „green“ basic menu or via the „Telemetry“ menu.



- The number in the bordered column indicates the output assigned in the „Assign output“ menu, if assigned. Channels without a channel number are not assigned to an output port.
- The number of channels displayed in this menu corresponds to the 32 control channels available in the ***Graupner mc-32ex HoTT*** transmitter. However, the number of channels that can actually be used also depends on the type of receiver used and the number of RC components connected to it, and is therefore usually lower.

WLAN & GPS

In the „WLAN & GPS“ menu of the „blue“ system menu, a WLAN or WiFi connection to a corresponding remote station can be set up.

Note

Since there is currently no GPS module installed in the transmitter, this function is unfortunately not available at the time these instructions were created and is therefore not accessible in the transmitter program.

WLAN

To turn on the transmitter's WiFi function, toggle the switch from OFF (▬) to ON (▬) position or vice versa:

- If no connection to a WiFi network has been set up beforehand, the search for available wireless networks starts immediately after the WiFi function of the transmitter is switched on..
- If a connection to one or more WiFi networks was previously set up, the transmitter establishes a connection to the last wireless network used.
- If a connection is to be established to a wireless network other than the one used last, tap the value field with the cloud symbol, whereupon a list of all available WLAN networks is displayed, see figure on the left. In this, the desired wireless network is to be selected by tapping. Usually, the necessary login data must then be entered, as described below.

Setting up WLAN step-by-step

1. *If necessary, tap the cloud symbol to display the list of available wireless networks.*
2. *Touch the line of the desired wireless network.*
   An on-screen keyboard will appear.
3. *Type in the required WiFi password.*
4. *Tap the ENTER button at the bottom right.*
   The connection to the selected wireless network is established.

Delete WLAN step-by-step

1. *If necessary, tap the cloud symbol to display the list of available wireless networks.*
2. *Tap the icon ⋯ in the line of the desired wireless network.*
3. *Tap the Forget button.*
4. *Tapping "OK" closes the overlay.*

Note

In the basic display of the ***Graupner mc-32ex HoTT*** transmitter, the icon indicates an active WLAN-connection.

Attention

Simultaneous operation of the remote control and WLAN functions of the ***Graupner mc-32ex Hott*** transmitter is possible, but both functions use the same operating frequencies and can therefore interfere with one another.

Bluetooth® & COM-Port

Bluetooth™ devices such as headsets for playing audio files or smartphones for data transfer to Android™ smartphones can be connected to the ***Graupner mc-32ex HoTT*** transmitter. For example, the HoTT Viewer app enables telemetry data and maps to be displayed on the smartphone display.

In the future, the serial COM port will offer the option of connecting the ***Graupner mc-32ex HoTT*** transmitter to external serial devices, e.g. B. to be able to use the PC software Data Explorer for the live logging function on a PC via a „COM port to USB" adapter. Alternatively, the USB connection with the „COM port" setting can also be used for this purpose.

The desired device is selected by tapping on the corresponding selection field.

Tapping the icon activates the Bluetooth™ function.

Tapping the magnifying glass icon starts the search for Bluetooth™ devices.

Found Bluetooth™ devices are displayed and the corresponding device can be selected.

Depending on the device, the password 0000 must be confirmed.

The search can be canceled by tapping the stop symbol.

When there is an active connection, the Bluetooth™ symbol lights up on the main display.

Note

The Bluetooth® function can be used while the ***Graupner mc-32ex HoTT*** transmitter is being operated remotely, but since both transmission and reception functions use the same operating frequencies, mutual interference and, above all, a slowed down telemetry connection cannot be ruled out

„Telemetry"

Totally four options are available in the „Telemetry" submenu of the „red" special menu of the ***Graupner mc-32ex HoTT*** transmitter.

The telemetry connection between transmitter and receiver takes place via the return channel of the HoTT receiver defined as the main receiver. If more than one recipient is bound to a model memory, this is the last binding as default. However, this assignment can be changed as desired in the „RF Set" submenu of the „green" system menu as well as in this „Telemetry" menu.

Depending on the setting in the value field of the „Tele. Speed", the transmission of telemetry data takes place only after every third data packet. As a result, the reaction to control buttons or changes to settings within the scope of a telemetry connection is delayed accordingly. This is not an error.

In principle, these menus are operated in the same way as the other menus of the ***Graupner mc-32ex HoTT*** transmitter. The only difference is the procedure in the text-based submenus of the „Settings & Display" option, see below.

Notes

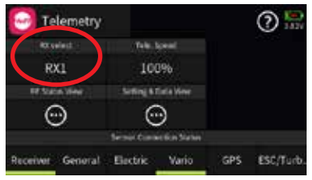
- Sensors must always be connected to the main receiver, as only the return channel of this receiver is determined by the transmitter.
- The above limitation of connecting sensors to the main receiver can be circumvented under certain circumstances. More detailed information can be found in the help text of the RF Set menu.

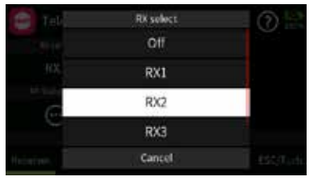
Attention

Programming on the model or sensors may not be carried out while the model is running and only when the engine is switched off or otherwise shut down!

Rx selection

Up to four receivers can be bound to a model memory in the „RF Set" submenu of the basic menu. However, a telemetry connection can be established to one of these maximum of four receivers. As default, this is always the last binding. All sensors may also have to be connected to this receiver, which is usually referred to as the main receiver, since normally only the return channel of the main receiver is determined by the transmitter. This is always marked with a tick in the „T.sel" column on the right edge of the display in the „RF Set" submenu.





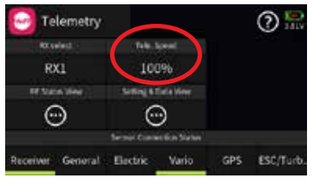
If several ticks are ticked, the telemetry can be switched over via channel 16. For more information, see the help text in the „RF Set" menu. In order to be able to easily display and manage the data of any additional receivers not only in the basic menu, but also in the „Telemetry" menu, the assignment can also be adjusted accordingly in this menu.

- OFF
  The transmitter's telemetry functions are switched off.

Attention

At the same time, the assignment in the column "T. sel." of the submenu "RF Set" changed. After completing the adjustment work, the original assignment may have to be restored!

Tele. Speed



Currently, the use of setting that deviates from the standard value „100%“ is only recommended if two receivers placed relatively close to each other are each controlled independently of one another by their own transmitter. So in the case of installation situations, such as those that can occur with a camera copter with separate control of camera and copter or with towed models for model parachutists. In such cases, the return channel can interfere with the control channel.

Value	Description
100 %	As default, the transmitter responds to the return channel of the selected receiver.
50 % / 33 %	The transmitter reacts to the return channel of the selected receiver with a corresponding delay.

RF Status display

This display visualizes the quality of the connection between transmitter and receiver. If there is no connection to a receiver, the submenu can be opened, but the displays remain empty. If necessary, switch on your receiving system or switch to the correct receiver.

- **Top row**

  Level of channels 1 ... 75 (US 1...70) of the 2.4 GHz band coming from the receiver in dBm at the transmitter.
- **Bottom row**

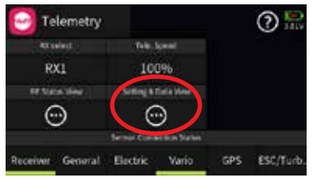
  Level of channels 1 ... 75 (US 1...70) of the 2.4 GHz band coming from the transmitter in dBm at the receiver.

Remarks

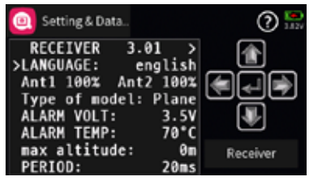
- The height of the bar is a measure of the respective reception level, expressed as logarithmic values with the unit dBm (1 mW = 0 dBm).
- 0 dBm corresponds to the two baselines in the graph, which means the worse level as the bar goes higher and vice versa.
- The dots above the bar mark the worst reception levels from the opening of the „RF Status“ display. A reset of these points is therefore possible by exiting and recalling this display.
- In addition to the graphic display of the reception level, additional numeric information is provided to the left. This means:

Value	Description
Tx ant.	Strength in % of the receiver‘s signal packets arriving at the transmitter
Tx Rate	Quality in % of the receiver‘s signal packets arriving at the transmitter
Tx dBm	Level in dBm of the receiver signal arriving at the transmitter.
Loss Pack.	Indicates the number of lost data packets.
Rx ant.	Quality in percentage of the signal packages from the transmitter arriving at the receiver.
Rx Rate	Quality by a percentage of the signal packages from the receiver arriving at the transmitter.
Rx dBm	Level in dBm expressed as the percentage of the transmitter signal arriving at the receiver.
Voltage	Actual operating voltage of the power supply of the receiving system.

Setting & Data View

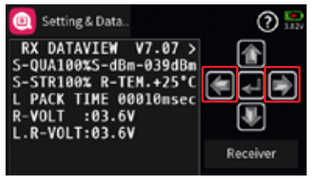


Tapping the symbol ⋯ opens the “Settings & Displays” display. If none of the named devices is highlighted with a green bar in the bottom line of the display and the display window remains empty after tapping the symbol ⋯ , there is no connection to a corresponding device. If necessary, switch on your receiving system or switch to the correct receiver or device.



- A detailed description of the submenus of standard receivers such as the ***Graupner GR-12*** or ***GR-16*** can be found in downloadable version of these receivers‘ instructions at ***www.graupner.com*** but also in the instructions of the various other hand-held and console transmitters with displays in the ***Graupner***-range. Except for the slightly different visual appearance of the ***Graupner mc-32ex HoTT*** transmitter display and the operation described below, all of these descriptions can be transferred 1:1 to this transmitter.
- Specialty receivers such as the receiver ***Graupner Hawk 18 HoTT*** (Order.-No. S1053), as well as sensors, etc. are equipped with independent variants of the „Settings & Displays“ menu. The description of these special submenus can be found in the respective manual.

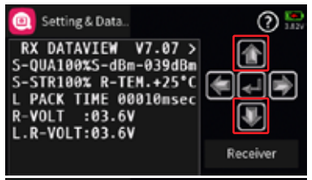
Function of the cross-shaped keypad



- **left and right selection keys**

  Similar to the directional arrow in the upper right corner of the framed display section (‹ ›), you can use the right or left button to switch between the individual pages of the respective submenus of the „Settings & Displays“ menu.

If only an angle bracket can be seen, then the respective first or last page in the display is active. Changing sides is then only possible in the indicated direction.



- **upper and lower selection keys**

  Menu lines in which parameters can be changed are marked by a preceding angle bracket (›). Tapping the lower or upper button moves this "›" pointer one line down or up.

  Lines that cannot be navigated to cannot be changed.

- **middle „ENTER" button**

  Tapping the center button activates or deactivates the value field of an editable parameter.

  As long as a parameter is displayed inversely, the selected value can be changed within the possible setting range using the upper or lower button.

- **"RECEIVER" button**

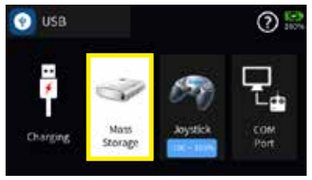
  If a sensor was connected before switching on the relevant receiver power supply, or if several sensors were connected to the receiver, it is indicated by a green bar at the bottom of the display of the „telemetry" menu, as shown on the left.

  To access the telemetry displays of these devices, open the „SETTING & DATAVIEW" display, then tap the value field labelled „Receiver" in the lower right corner and select the desired device in the selection window that appears The operation of these displays is the same as described above under „function of the cross-shaped keypad".

Note

All settings made via the „telemetry" menu in the receiver, such as, fail-safe, servo reverse, end points adjustment, mixer and curve settings, etc. are stored exclusively in the receiver's settings. Most of these settings can be made directly on the transmitter which is the proper way for setting up your model memories. In case you choose to do this on the receiver you must reinitialize the receiver when installing into another model to avoid taking over settings that may not work with another model.

Import and export of model data



Saving and exchanging model data between compatible transmitters is carried out via the USB C socket on the front and the „mass storage" setting on the transmitter side using a standard laptop or PC file explorer or manager. The individual model memories can be found on the ***Graupner mc-32ex HoTT*** transmitter under the path \\mc-32\Model\mc-32.

Exchange of model data

The model memories of the hand-held transmitters ***Graupner mz-16 HoTT***, ***mz-32 HoTT*** and the console transmitter ***Graupner mc-32ex HoTT*** are basically compatible, BUT:

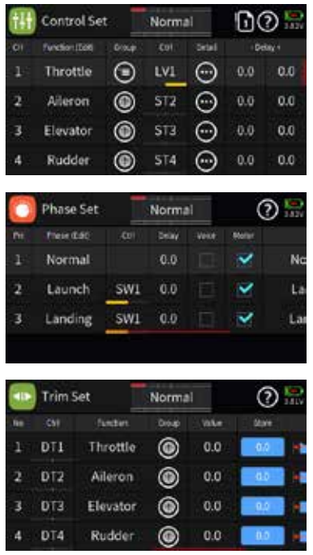
- The mandatory prerequisite for an import into the other transmitter is that the desired model memory is copied or moved to the other directory using a PC or laptop. For example, from „\\mz-16\Model\mz-16" to „\\mc-32\Model \mc-32" etc. or vice versa.
- If, for any reason, the model name on the PC or laptop is hanged or added, its length must not exceed 16 characters. Otherwise the model memory will not be displayed in the model list.

Attention

- The ***Graupner mc-32ex*** transmitter is largely identical to the ***Graupner mc-32*** transmitter, which come into the market around 2012 with two SW displays, is NOT compatible with ANY of the current transmitters.
- The exchange of model memories between the transmitter ***Graupner mz-16/32*** and ***Graupner mc-32ex*** is possible due to the identical data structure of the respective model memories. There are even no restrictions between the two hand-held transmitters ***Graupner mz-16*** and ***mz-32*** as long as the number of channels is sufficient for the model memory. However, due to design-related physical differences in the transmitter and switch structure, this is not the case when exchanging model memories between a hand-held and a console transmitter. As soon as the concerned transmitter detects these differences when used with imported model memory, all control assignments with physical switches' are deleted. After loading the imported model memory for the first time, all these assignments must be reset in the transmitter. Possibly the same applies to programmed digital switches.

For example:

Export transmitter mz-32

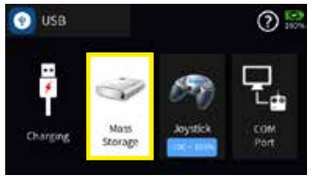


after import to mc-32ex

and so on.

- Receivers are only to be bound after the first restart.
- Due to different features, deviations in model programming after importing model data cannot be ruled out.
- In case of the change of the memory structure as part of further development due to refreshed features, the resulting incompatibilities cannot be ruled out.
- For all of these reasons, we recommend that you carefully check all model functions after importing and starting up a model memory in a different transmitter type and, if necessary, adapting them to the respective transmitter.

Firmware Update



Firmware updates of the transmitter are carried out either via the USB-C socket on the front and the „mass storage" setting on the transmitter side using a laptop or PC with Windows 7 ... 11 or via WLAN.

The programs and files required for wired updates are combined in a software package and are available both in the „Util" directory on the mass storage device of the ***Graupner mc-32ex HoTT*** transmitter and for the corresponding product at ***www.graupner.com***.

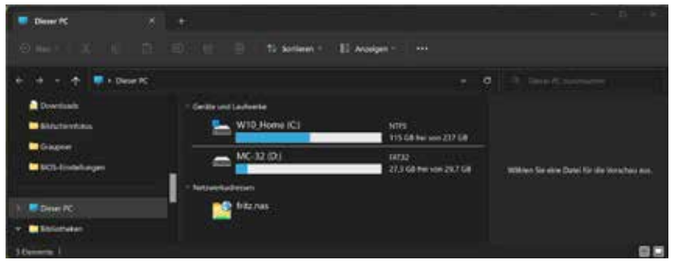
For wired updates, download this software package from the transmitter's mass storage device or from the Internet onto a Windows PC or laptop.

Notes

- Please note that trouble-free communication between the HoTT components used can only be guaranteed if the firmware is compatible. The programs and files required for updating are therefore combined into one package, which is currently called „HoTT_Software_V4.zip". This program collection is also located on the transmitter's SD card in the „Util" directory.
- Only use your transmitter with the current software version.

Copy from mass storage step-by-step

1. *Connect the **Graupner mc-32ex HoTT** transmitter to a Windows PC or a laptop via the USB C socket on the front.*
2. *Turn on the transmitter.*
3. *In the automatically displayed selection screen of the transmitter, tap on „mass storage" or, if necessary, select and activate it manually in the „USB" submenu of the „blue" system menu.*
4. *In Windows Explorer or another file manager, click on „This PC" ... under „Devices and drives" you should see a drive „mc-32" with the drive letter (X), for example:*



A message that may appear on the PC or laptop from the operating system "Do you want to check and repair "mc-32 (X:)"?" can be ignored or optionally confirmed.

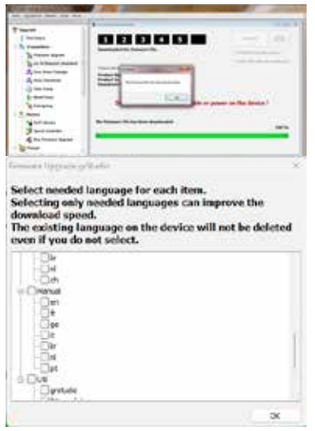
5. In the PC's file explorer, switch to the „mc-32(X:)" drive.
6. *Switch to the „Util" directory.*
7. *Copy the required files from this directory to the PC or laptop, unpack and install if necessary*

Note

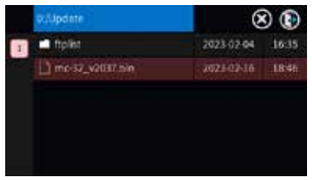
If the „Firmware_Upgrade_gr_Studio" program is already on the Windows PC or laptop, then it may be necessary to manually install the „Virtual COM Port" driver and an update of the „ gr-Studios" to be carried out.

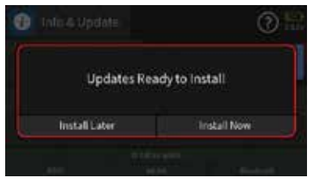
Download an update step-by-step

1. *Connect the **Graupner mc-32ex HoTT** transmitter to a Windows PC or laptop via the USB C socket on the front.*
2. *If necessary, switch on the transmitter.*
3. *In the automatically displayed selection display of the transmitter, tap on „mass storage" or, if necessary, select and activate it manually in the „USB" submenu of the „blue" system menu.*
4. *Start the „Firmware_Upgrade_gr_Studio" program on the PC or laptop*
5. *If necessary, agree to the proposal for a program update.*
6. *In the „Sender" or „Transmitter" section of the „Firmware_Upgrade_gr_Studio" start the program part „mz-32 firmware download".*
   - *The connection to the PC is not allowed during the download be separated! Therefore, make sure that there is no interference between the transmitter and the computer.*



7. *Start the firmware download by clicking the download button.*
   When downloading for the first time and possibly also later occasionally, before clicking the „Download" button, a tick should be placed in front of „Download inclusive resource like help and voice files etc.
   - *After downloading the firmware file, a selection window appears, in which the additional resource files to be downloaded, including the required language version, can be selected, see figure on the left.*
     - *This option should be used, since this is the only way to This option should be used, since this is the only way to ensure that the help texts and the help in the form of PDF files in the „Manual" folder of the transmitter are always up to date.*
8. *For the rest, follow the instructions of the program.*
9. *As soon as the message „complete" is displayed, the download is complete.*
10. *Tap on „Mass memory" in the transmitter display*
    A security query is displayed.
    - *Tapping „back" cancels the process.*
    - *Touching „OK" closes the security prompt.*
11. *Tap "USB" at the top left to exit the transmitter menu.*





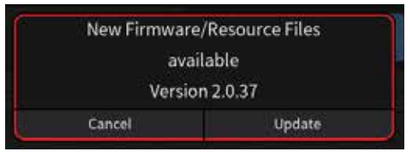
Updating the transmitter step-by-step

1. *Switch to the „Info & Update" submenu of the system menu.*
2. *Tap the blue „SD card update" button.*
3. *Touch the desired firmware version.*
4. *Tap the icon ✓ at the top right.*
   – *The icon ✓ is replaced with ⊗ .*
   – *Tapping the icon ⊗ cancels the process.*
5. *Tapping the icon ⏻ at the top right of the display closes the menu.*
   – *If the update has been confirmed, appears after exiting of the menu the overlay shown on the left:*
      – *Tapping "Install Now" starts the installation.*
      – *Tapping „Install Later" allows the start installation at a later date. However, if the transmitter is switched off in the meantime, the process must be started all over again.*

WLAN Update

During activated WLAN connections, the transmitter checks regularly whether an update is available. In this case, a small red one will appear in WLAN symbol of the basic display, in the „Info & Update" menu of the „blue" system menu and the blue field „FTP Ver." in the „Info & Update" menu at the top right Circle with a white „N" superimposed. Supplemented with the version number of the update offered in the „Info & Update" menu, see figures on the left:

- Tapping the blue field „FTP Ver." opens a query:



- Tapping „Update" starts the process:
  The transmitter shuts down and starts downloading and installing the new firmware and, if applicable, newer resource files and storing them on the transmitter's internal mass storage.
  Depending on the scope of the update and the quality and speed of WLAN connection in question, this process can take some time.
- Tapping „Cancel" cancels the process.
- Tapping the unmarked blue field „FTP Ver." starts the manual search for an update.
  For example, if no update is available, the following appears:

  – Tapping „Cancel" cancels the process.
  – Tapping on „Update" starts the update process, with for example to update resource files such as B. Help texts.

Notes

- The end of a WLAN update, but in particular the end of a resource update, is not shown directly on the display, but the transmitter restarts automatically after the download of the files and after restarting the firmware will be installed. After another restart the update has been completed. So as long as the transmitter does not restart or has already started, the update is not completed.
- If the transmitter is switched off during an update, the update can be called up again and continued at the next opportunity by manually triggering it using the „FTP Ver." button.
- If the charge status of the battery reaches a critical value during an update, the update process is automatically aborted and can, if necessary after charging the battery or connecting the transmitter to a USB power source, also be triggered manually using the „FTP Ver." buttons are called and continued again.

Forced update

If a firmware update of the transmitter should fail or the transmitter software should "hangs up" and the transmitter can no longer be switched off via the power switch, open the bottom of the transmitter and unplug the transmitter battery. After some seconds wait, reconnect the battery and after closing the transmitter, proceed as follows:

Forced update step-by-step

1. *If necessary, charge the battery sufficiently.*
2. *Ensure that the transmitter can only use the transmitter battery connected in the battery compartment as a power source. Otherwise the key codes described in points 2 and 3 will not work.*
3. *Press and hold the top two buttons on the left and right of the display while turning on the transmitter.*
4. *If the LED to the right of the power switch lights up orange, press and hold the two middle buttons between the left and right of the display.*

If the LED to the right of the power switch lights up green, the buttons can be released.

5. *Subsequently, the forced update starts with the latest firmware version available in the „Update" directory of the transmitter.*
   - *As soon as the update has been completed successfully, the transmitter restarts and can be used again.*
   - *If the forced update fails due to a missing update file, then proceed as follows:*

Force boot into „mass storage" mode

If the transmitter starts, but does not go beyond the basic setting display, for example, or otherwise shows abnormal startup behavior, then proceed as follows:

Note

A video is also available at the following URL:

https://www.youtube.com/watch?v=_WEYLa_kHqU&t=321s

Forced start in USB mode „mass storage" step-by-step

1. *If necessary, charge the battery sufficiently.*
2. *Ensure that the transmitter can only use the transmitter battery connected in the battery compartment as a power source. Otherwise the key codes described in points 3 and 4 will not work.*
3. *If the transmitter can no longer be switched off, open the transmitter and unplug the transmitter battery. After waiting a few seconds, reconnect the battery and, after closing the transmitter, do the following:*
4. *Press and hold the two lower buttons between the left and right of the display and switch on the transmitter at the same time.*
5. *When the LED to the right of the power switch lights up orange, press and hold the two middle buttons between the left and right of the display.*

   If the LED to the right of the power button lights up red, the buttons can be released.
6. *Now, following the instructions on the transmitter display, connect the transmitter to the PC or laptop using a USB cable.*
   - *As soon as the connection is established, the message „USB Mass Storage Connected" appears in white text on the transmitter's display.*
   - *A drive „mc-32 (X:)" appears in the file explorer of the PC or laptop.*

7. *As soon as it is possible to access the transmitter's mass memory via PC or laptop, its integrity must be checked using the PC or laptop.*
   - *Depending on the result of the check, the mass storage device should be „repaired" or „formatted" using the PC or laptop.*
8. *After formatting is completed, turn the transmitter off and on again.*
   - *There should now be a file called GraupnerDisc.cfg in the base directory of the mass storage device. If necessary, this file can also be downloaded from the download area of the transmitter.*
9. *If necessary, load a file suitable for updating the **Graupner mc-32ex HoTT** transmitter as described under „Updating the transmitter step-by-step".*
10. *Turn off the transmitter by sliding the power switch to the right.*
11. *Disconnect from the PC or laptop.*
12. *Start the „Forced update" as described above.*
13. *If the usual widgets are then missing in the basic display, the widget presettings can still be set with the help of the line „Model presetting" to be found at the bottom left. of the menu "System. config." of the blue "System" menu.*

CE

EN - SIMPLIFIED DECLARATION OF CONFORMITY

The ***Graupner*** ***Co. Ltd.*** company hereby declares, that the radio system type **33040** ***Graupner*** ***mc-32ex HoTT*** complies with directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: **www.graupner.com**

Manufacturer

Graupner Co., Ltd
Post Code: 14557
8th F, 202 Dong, Chunui Techno-Park II, 18, 198 Street
Bucheon-ro, Wonmi-Gu, Bucheon-Shi, Gyeonggi-do
South Korea

Notes on environmental protection

This symbol on the product, the instructions for use or the packaging indicates that this product must not be disposed of with normal household waste at the end of life-span. It must be handed in at a collection point for the recycling of electrical and electronic equipment.

The materials are recyclable according to their labeling. By reusing, material recycling or other forms of recycling old devices, you are making an important contribution to environmental protection.

Batteries and accumulators must be removed from the device and disposed of separately at an appropriate collection point. Please inquire at the municipal administration for the appropriate disposal site.

Maintenance and Care

The product does not require any maintenance. However, please protect it from dust, dirt and moisture! To clean the product, just rub it lightly with a dry cloth (do not use detergent!).

Warranty conditions

The respective distributor of ***Graupner*** products grants a guarantee of 24 months from the date of purchase of the product. The guarantee only applies to material and/or functional defects that already existed when the product was purchased. Damage caused by wear and tear, overload, wrong accessories or improper handling are excluded from the guarantee. The legal rights and claims of the consumer are not affected by this guarantee. Before making a complaint or returning the product, please check it carefully for defects, as we will have to charge you for the costs incurred if the items are free from defects.

This manual is for informational purposes only and is subject to change without notice. The current version can be found on the Internet at ***www.graupner.com***. In addition, ***Graupner*** assumes no responsibility or liability for errors or inaccuracies that may appear in the operation manuals.

No liability to be accepted for printing errors.


8 809403 499891 >