

# Manual

## GR-4 HoTT and GR-8 HoTT V2

2 channel HoTT and 4 channel HoTT V2 receiver

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No. 33502

No. 33504



CE

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## Introduction

Thank you very much for purchasing a **Graupner GR-4 HoTT** or **GR-8 HoTT V2** receiver.

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

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

This product complies with national and European legal requirements.

To maintain this condition and to ensure safe operation, you must read and follow this user manual and all the safety notes before using the product and you have to respect those notes also for future use!



### Note

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

## Service centre

<b>Graupner Central Service</b> Graupner GmbH Henriettenstrasse 96 D-73230 Kirchheim / Teck	<b>Servicehotline</b> ☎ (+49) (0)7021/722-130 Monday- Thursday: 9:15 am- 4:00 pm Friday: 9:15 am- 1:00 pm ✉ <b>service@graupner.de</b>
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**Graupner in Internet** For the service centers outside Germany please refer to our web site **www.graupner.de**.

## Intended use

The receiver only be used for the purpose specified by the manufacturer for operation of remote controlled models without passengers. This includes all types of UAVs or all types of unmanned aerial vehicles as well as all types of unmanned land and water vehicles. Any other type of use is impermissible and may cause significant property damage and/or personal injury. No warranty or liability is therefore offered for any improper use not covered by these provisions.

In addition, it is explicitly pointed out that you must inform yourself about the laws and regulations applicable at your respective starting point before starting the remote control operation. Such conditions may differ from state to state, but this must be followed in every case.

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



### Note

The **GR-8 HoTT V2** receiver can only be bound to transmitters that control the HoTT V2 transmission protocol. This receiver is not suitable for operation with "normal" HoTT transmitters. Suitable transmitters are currently only the **Graupner** transmitters **X-8N** and **X-8E**.

## Target group

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

## Package content

- Receiver **GR-4 HoTT** or **GR-8 HoTT V2**
- Manual



### Note

**Graupner/SJ** works continuously to the further development of the products. We must therefore reserve the right to change the scope of delivery in terms of form, technology and equipment.

## Technical data

	<b>GR-4 HoTT</b>	<b>GR-8 HoTT V2</b>
Operating voltage	3,6 ... 8,4V	3,6 ... 8,4V
Frequency	2,4GHz	2,4GHz
Modulation	FHSS	FHSS
Transmission protocol	HoTT	HoTT V2
Control functions	2	4
Power consumption	approx. 35mA	approx. 70mA
Temperature range	-15 ... +70 °C	-15 ... +70 °C
Antenna length	1x 145mm, of which the last 30 mm active	1x 145mm, of which the last 30 mm active
Dimensions	30 x 21 x 15mm	30 x 21 x 15mm
Weight	6g	6g

## accessories

	<b>GR-4 HoTT</b>	<b>GR-8 HoTT V2</b>
Transmitter	Standard transmitter	<b>X-8E</b> and <b>X-8N</b>
Servo	Standard servos	S4086 S4087 S4088
ESC	S3026.T	S3051 S3052
ESC with WiFi		S3078 S3084 S3085 S3086

## Symbol description



Always observe the information indicated by these warning signs. Particularly those which are additionally marked with the words **CAUTION** or **WARNING**.

The signal word **WARNING** indicates the potential for serious injury, the signal word **CAUTION** indicates possibility of lighter injuries.

The signal word **Note** indicates potential malfunctions.

**Attention** indicates potential damages to objects.

## Safety notes



These safety instructions are intended not only to protect the product, but also for your own and other people's safety. Therefore please read this section very carefully before using the product!

- Do not leave the packaging material lying around, this could be a dangerous toy for children.
- Persons, including children, with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, or not capable to use safely the receiver must not use the receiver without supervision or instruction by a responsible person.
- Operation and use of radio-controlled models needs to be learnt! If you have never driven such a model, then start extra carefully and make sure to be familiar with the reactions of the model to the remote control commands. Proceed responsibly.
- First, always perform a range and function test on the ground (to do so, hold your model tight), before you use your model. Repeat the test with running motor and with short throttle bursts.
- Only use the components and spare parts that we recommend. Always use matching, original **Graupner** plug-in connections of the same design and material.
- Make sure that all of the plug-in connections are tight. When disconnecting the plug-in connections, do not pull the cables.
- Protect the receiver from dust, dirt, moisture and foreign parts. Do not expose it to vibrations or to extreme heat or cold. The models may only be operated remotely in normal outside temperatures such as from -10°C to +55°C.
- Always use all your HoTT components only with the latest firmware version.
- Before you start using the remote control model, you have to check the further relevant laws and regulations. These laws you must obey in every case. Pay attention to the possibly different laws of the countries.
- Due to safety and licensing reasons (CE), any reconstruction and/or modification of the product is prohibited.
- If you have questions which cannot be answered by the operating manual, please contact us or another expert in the field.

For your safety by handling the transmitter and the receiver



### WARNING

**Also while programming the transmitter, make sure that a connected motor cannot accidentally start. Disconnect the fuel supply or drive battery beforehand.**

**Avoid impacts and crushing. Check the receiver regularly for damages to the housings and cables, specially after model crashes.**

Damaged or wet receiver, even if re-dried, should no longer be used!



**CAUTION**

Avoid every kind of short-circuit in all sockets of the transmitter! Risk of fire! Use only the suitable connectors. In no case the electronic component of the transmitter or of the receiver may be changed or modified. Due to licensing reasons, any reconstruction and/or modification of the product is prohibited.



**Note**

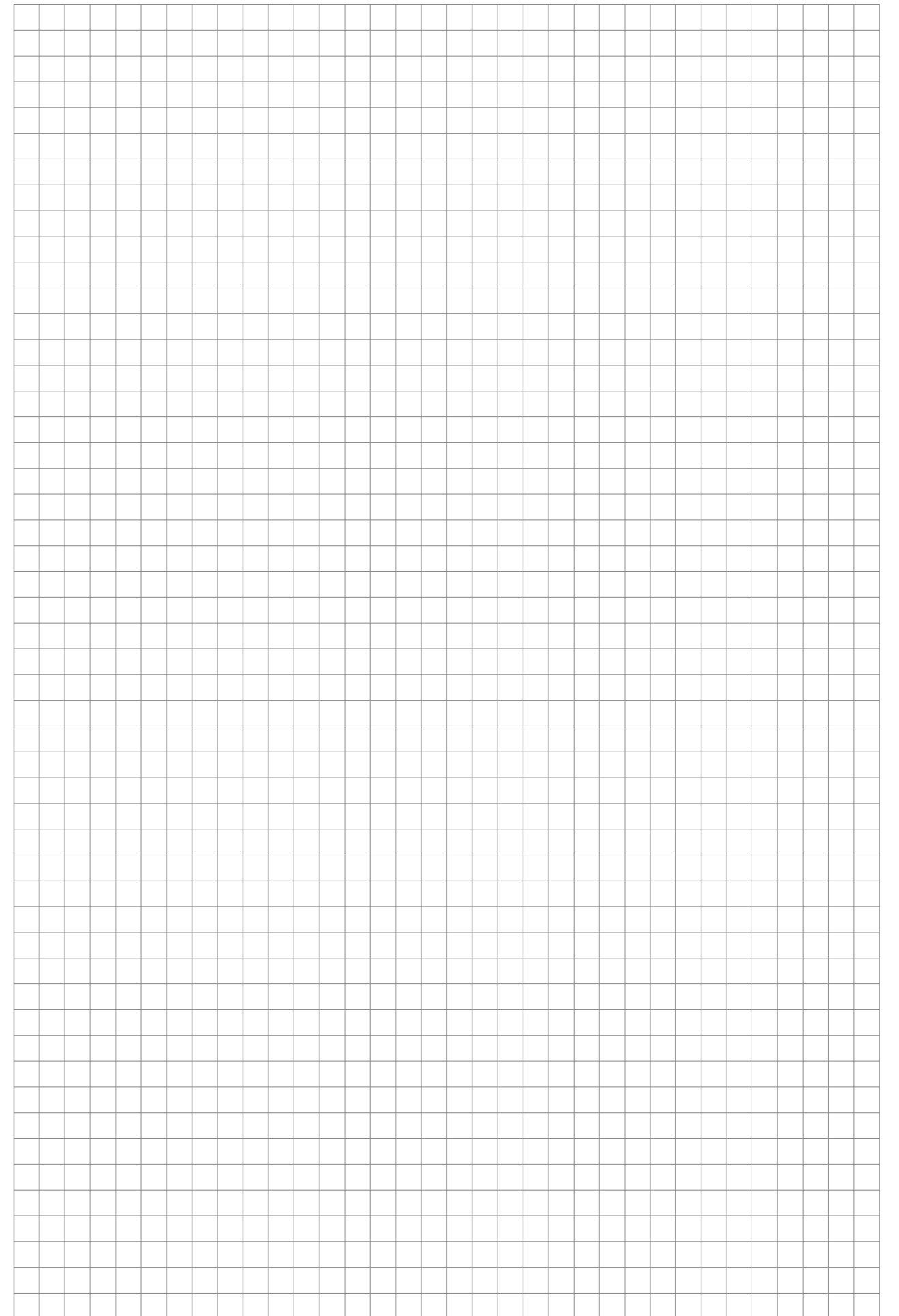
During transport protect the model and the transmitter from damages.

For your safety by handling the batteries



**CAUTION**

- Protect the batteries from dust, dirt, moisture, heat and vibrations. Only use in dry locations.
- Do not use any damaged battery.
- Batteries may not be heated, burned, short-circuited.
- If handled improperly, there is a danger of fire, explosion, irritation and burns.
- Leaked electrolyte is caustic and should not be touched or come into contact with your eyes. In case of emergency, rinse with a large quantity of water and consult a Med. Doctor.
- Stock the batteries in dry and fresh conditions.
- Dispose of the battery in the proper disposal centers.



## Installing the receiver

The receiver must be protected against dust, exhaust gases, splash water, rests of oil etc. in the model. When you install your receiver, make sure that it is not excessively airtight to prevent it from overheating during operation.

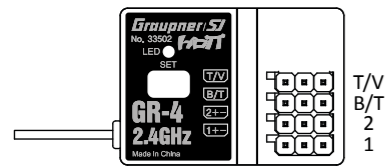
Servo cables may not be wound around antenna or run next to it. Make sure that the cables cannot shift to lie directly adjacent to antenna during flight.

In the case of carbon fibre chassis, at least the last 35 mm of the antennas shall be routed outside.

## Connection assignment

The connection cables to be connected to the receiver must be plugged with the black or brown cable outwards into the connector strip of the receiver, see illustrations. The polarity of the plug-in system cannot be reversed. Do not apply force. Never connect the connecting cables "across", over 3 connections, to the receiver. This immediately leads to a short circuit of the power supply; the destruction of any connected components as well as the immediate loss of all warranty claims.

### Receiver **GR-4 HoTT**



The **GR-4 HoTT** receiver has a total of 4 slots:

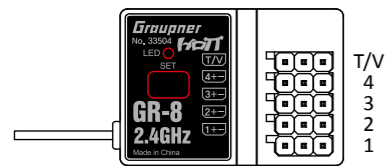
1	Steering servo
2	Throttle servo or ESC
B/T	HoTT telemetry sensors / Power supply / Updates
T/V	Temperature / voltage sensor



#### Note

The **GR-4 HoTT** receiver is compatible with all **Graupner** HoTT transmitters.

### Receiver **GR-8 HoTT V2**



The **GR-8 HoTT V2** receiver has a total of 5 slots:

1	Steering servo
2	Throttle servo or ESC
3	free or battery or special function so as firmware updates
4	free or battery or special function
T/V	Temperature / voltage sensor



#### Note

the **GR-8 HoTT V2** receiver is actually only compatible with the **Graupner** transmitters **X-8E** and **X-8N**.

## Slots 1 and 2 or 1 to 4

The steering servo is to be connected to port 1 and the throttle servo of combustion engine or the speed controller of electric models to port 2.

Ports 3 and 4 of the **GR-8 HoTT V2** are freely assignable control channels for special functions.

Both on the transmitter side and via the telemetry menu, see below, each of the four ports of the **GR-8 HoTT V2** receiver can be arbitrarily switched to one of a total of six connection protocols, extending the range of connectable RC components from standard servo to ultra-short pulse digital controlled speed controller.

The power supply of the receiver as well as the RC components can be connected to it over each of these four connections.

## Port "B/T"



#### Note

Only available with the **GR-4 HoTT** receiver.

This socket is suitable for connecting the receiver power supply as well as for connecting HoTT telemetry sensors and for updating the receiver.

The voltage applied to this socket operating voltage of the receiving system is monitored. As soon as the warning threshold set in the line "AL RX-V" of the receiver menu "RX SETUP" is exceeded, the transmitter emits an acoustic alarm.

## Port "T/V"

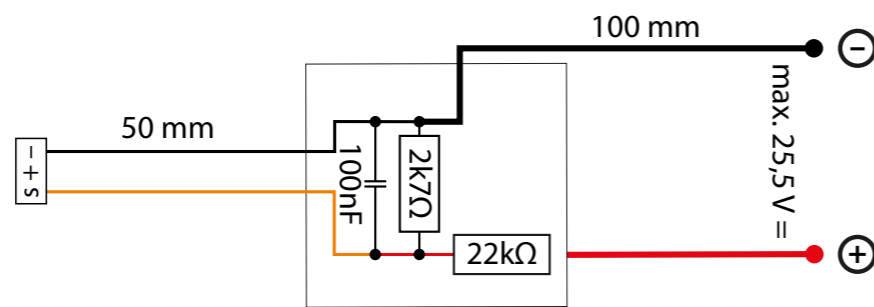
This socket is only suitable for connection of the optional external voltage and temperature sensor with the order no. S8362 and the voltage measurement described below.

If a sensor is connected, the warning threshold set in the lines "AL EX-V" or "AL EX-T" of the receiver menu "RX SETUP" becomes effective. As soon as this value is exceeded, the transmitter issues an alarm.



#### Attention

This socket is neither suitable for connecting a receiver power supply nor for the direct connection of a drive battery! As a result, the receiver would be destroyed immediately. The socket is only suitable for connecting the mentioned sensors or for measuring the voltage of a battery according to the following scheme:



## Receiver binding

To establish a connection with the transmitter, the **Graupner** HoTT receiver must first be "bound" to at least one model memory in "its" **Graupner** HoTT transmitter. This process is generally called "binding". However, the methods to be used are not always the same, so the following step-by-step instructions apply only to binding a **GR-4 HoTT** or **GR-8 HoTT V2** receiver to any transmitter:

### Binding step-by-step

1. Prepare the transmitter or model memory to be bound according to the instructions for binding.
2. Eventually, switch on the receiver power supply.  
*The LED of the **GR-4 HoTT** or **GR-8 HoTT V2** receiver blinks in red.*
3. Press the SET button on the receiver until the receiver LED flashes red / green.  
  
|| *The receiver is for the following 3 seconds in Binding mode.*
4. Within this approximately 3 seconds start the transmitter-side binding according to the instructions of the transmitter.

If the green LED of the receiver **GR-4 HoTT** or **GR-8 HoTT V2** turns solid green after a few seconds and the transmitter signals a correct connection according to his instructions, the binding process has been successfully completed. The transmitter/receiver combination is ready for operation.

If the LED of the receiver **GR-4 HoTT** or **GR-8 HoTT V2** flashes red again and the transmitter signals a missing connection, the "Binding" has failed. Possibly, change the positions of the devices involved and repeat the entire procedure.

## Receiver reset

To reset the receiver, press and hold its SET button while turning on the power to the receiver:

If the reset has been triggered with the transmitter switched off or with an unbound receiver, the red LED shortly lights up before the green LED lights up and the red LED flashes 2 times in parallel. Then both LEDs go off before only the red LED continues to flash. Release the button once the LEDs go dark.

If the reset is performed with a not bound receiver, you can then start a binding process at any time.

If a reset has already been carried out on an already-bound receiver and the associated model memory is active in the switched-on transmitter, the green LED of the receiver should light steadily after approx. 2 to 3 seconds and thus signal a correct connection to the transmitter. Otherwise the process has to be repeated.



### Notes

- Through a RESET ALL of the settings in the receiver are brought to the factory settings with the exception of the HoTT synchronization information!
- If a reset is performed accidentally, all of these settings that were made using the "Telemetry" menu in the receiver should be restored.
- Resetting is particularly recommendable when you want to switch a receiver to a different model. This makes it easy to keep settings which do not match from being transferred.

## "Telemetry" menu

### SETTING & DATA VIEW

The basic handling of the "Telemetry" menu is described in the respective transmitter instructions or the instructions of the Smart-Box. By way of derogation, only in certain receivers the menu structure is summarized under the generic term "setting & data view". These instructions also provide information on how to access this menu. Change accordingly to the first setting page of the receiver to set up.



#### Note

The setting values shown in the following display illustrations always show the standard values.

#### Receiver **GR-4 HoTT**

```
RECEIVER 0.09
>AL RX-V ( 5.1V) : 3.7V
AL RX-T (+31°C) : 65°C
PERIOD      : 20ms
AL EX-V ( 0:0V) : AUTO
AL EX-T ( --°C) : 100°C
```

The **GR-4 HoTT** receiver has only one display page. In it, if necessary, some warning thresholds can be adjusted:

Value	Alarm threshold	Adjustment range
AL RX-V	Receiver power supply	3.5 ... 8.0V
AL RX-T	Receiver temperature	30 ... 80 °C
PERIOD	None	10 or 20ms
AL EX-V	external voltage sensor to port "T/V"	AUTO / 2 ... 24V
AL EX-T	external temperature sensor to port "T/V"	50 ... 150 °C



#### Notes

- If your system is used exclusively with digital servos, you can set a cycle time (frame rate) of 10 ms in the value field of the line "PERIOD". If your system includes some or uses exclusively analogue servos, always select 20 ms since the analogue servos may be overloaded and respond by "jittering" or "growling".
- The values shown in parentheses are the actual operating data transmitted by the receiver via return channel.

#### Receiver **GR-8 HoTT V2**

```
RX DATA VIEW >
S-QUA      : 99%
S-STR      : 100%
S-dBm     : -31dBm
RX-TEMP    : +38°C
LOSS PACK  : 6ms
BATT VOLT  : 5.5V
LOW VOLT   : 5.5V
```

### RX DATA VIEW

In this display page of the submenu "SETTING & DATA VIEW" you will not be able to make any settings. This page is for information only:

Value	Description
S-QUA	Quality expressed as a percentage of the signal packages from the transmitter arriving at the receiver
S-STR	Signal strength expressed in percentage of the signal from the transmitter arriving at the receiver
S-dBm	Level in dBm expressed as the percentage of the transmitter signal arriving at the receiver
RX-TEMP	Receiver temperature in °C
LOSS PACK	Shows the longest time in milliseconds in which data packages were lost when transmitting from the transmitter to receiver
BATT VOLT	Current operating voltage of the receiver
LOW VOLT	Current operating voltage of the receiver since the last time the receiver was turned on

### RX SETUP

In this display, some warning thresholds may be adjusted. It have the following meanings:

Value	Alarm threshold	Adjustment range
AL RX-V	Receiver power supply	3.5 ... 8.0V
AL RX-T	Receiver temperature	30 ... 80 °C
AL EX-V	external voltage sensor to port "T/V"	AUTO / 2 ... 24V
AL EX-T	external temperature sensor to port "T/V"	50 ... 200 °C
LANGUAGE	Language	france german english



#### Note

The values shown in parentheses are the actual operating data transmitted by the receiver via return channel.



```

CH FUNCTION <>
>CH1 NSR12m0 1500µs
CH2 NSR12m0 1500µs
CH3 NSR12m0 1500µs
CH4 NSR12m0 1500µs

*NORMAL SIGNAL 12.0ms

```

## CH FUNCTION

In this display, it may be necessary to adapt the connection protocols at the four receiver connections to the properties of the respectively connected RC components. The information given by the manufacturer of the respective RC component must be observed !!!

The following selections are available for each control channel:

- USR3m0 0 : ULTRA SIGNAL 3.0msec
- digital "Ultra" protocol with a pulse sequence of 3.0 msec
- FSR3m00 : FAST SIGNAL 3.0msec
- digital "Fast" protocol with a pulse sequence of 3.0 msec
- SUMD-V2 : FAST SIGNAL BUS 3.0msec
- digital BUS signal with a pulse sequence of 3.0 msec
- NSR6m00 : NORMAL SIGNAL 6.0msec
- "Normal" analogue control signal with ultra-short pulse sequence
- NSR12m0 : NORMAL SIGNAL 12.0msec
- "Normal" analogue control signal, suitable for digital servos
- NSR24m0 : NORMAL SIGNAL 24.0msec
- "Normal" analogue control signal, suitable for standard servos

In principle, these protocols can be selected or set per control channel both in this menu and according to the respective transmitter instructions in a transmitter-side menu.



### Attention

In both cases, however, changes made will only take effect after a restart of both the receiver and the sender in the following order.

#### Restart step by step

1. Switch the receiver off.
2. Switch the transmitter off.
3. Switch the transmitter on.
4. Switch the receiver on.

## DEVICE LIST VIEW

If at least one channel has been changed to "SUMD V2" in the "CH FUNCTION" display described above and suitable RC components are connected to it before the receiver is switched on again, these components are displayed in this list.

```

DEVICE LIST VIEW <>
No Device Ch Port
>00 RECEIVER -- --
01 ----- -- --
02 CAR ESC-- 02 02
03 ----- -- --
04 ----- -- --
05 ----- -- --

```

```

FAIL SAFE <
>F/S MEMORY: NEIN
F/S DELAY : 100ms
CH1 (STR) : HOLD
CH2 (THR) : HOLD
CH3 (AUX) : HOLD
CH4 (AUX) : HOLD

```

## FAIL SAFE

The simpler and recommended way to fail-safe settings is to use the transmitter's Fail Safe menu.

Similar, albeit more cumbersome, is the "FAILSAFE" option described below.

In both cases, these settings determine the behaviour of the receiver in the event of interference with the transmission from the transmitter to the receiver.

- F/S MEMORY  
After switching to "YES" and confirming it, save the current servo positions in the receiver.
- F/S DELAY  
This line specifies how long the receiver is going to keep the RC components connected to it, after the connection has been terminated, at their most recently received positions before forwarding the previously stored fail-safe positions to the connected components. This setting is adopted by all the channels and only affects the servos programmed for "F/S" mode.

Adjustment range: 50, 100, 250, 500, 750ms and 1,0 second

- CH1 ... CH4  
The factory setting for four channels is "HOLD".  
Each selected channel (servo connector of the receiver) can be set to:
  - F/S  
With this selection, the corresponding servo moves into the position displayed in µs in the line "POSITION" in case of a malfunction after expiration of the delay set in the right-hand line for the remainder of the malfunction.  
1500µs corresponds to the neutral position
  - HOLD  
With the "HOLD" setting, over the course of a malfunction, the servo remains in the last correctly received servo position.
  - FREE  
With a setting of "FREE", the receiver sets the transmission of (buffered) control pulses for the relevant servo output for the duration of the fault in the event of a fault. The receiver switches off of the pulse line in a manner of speaking.

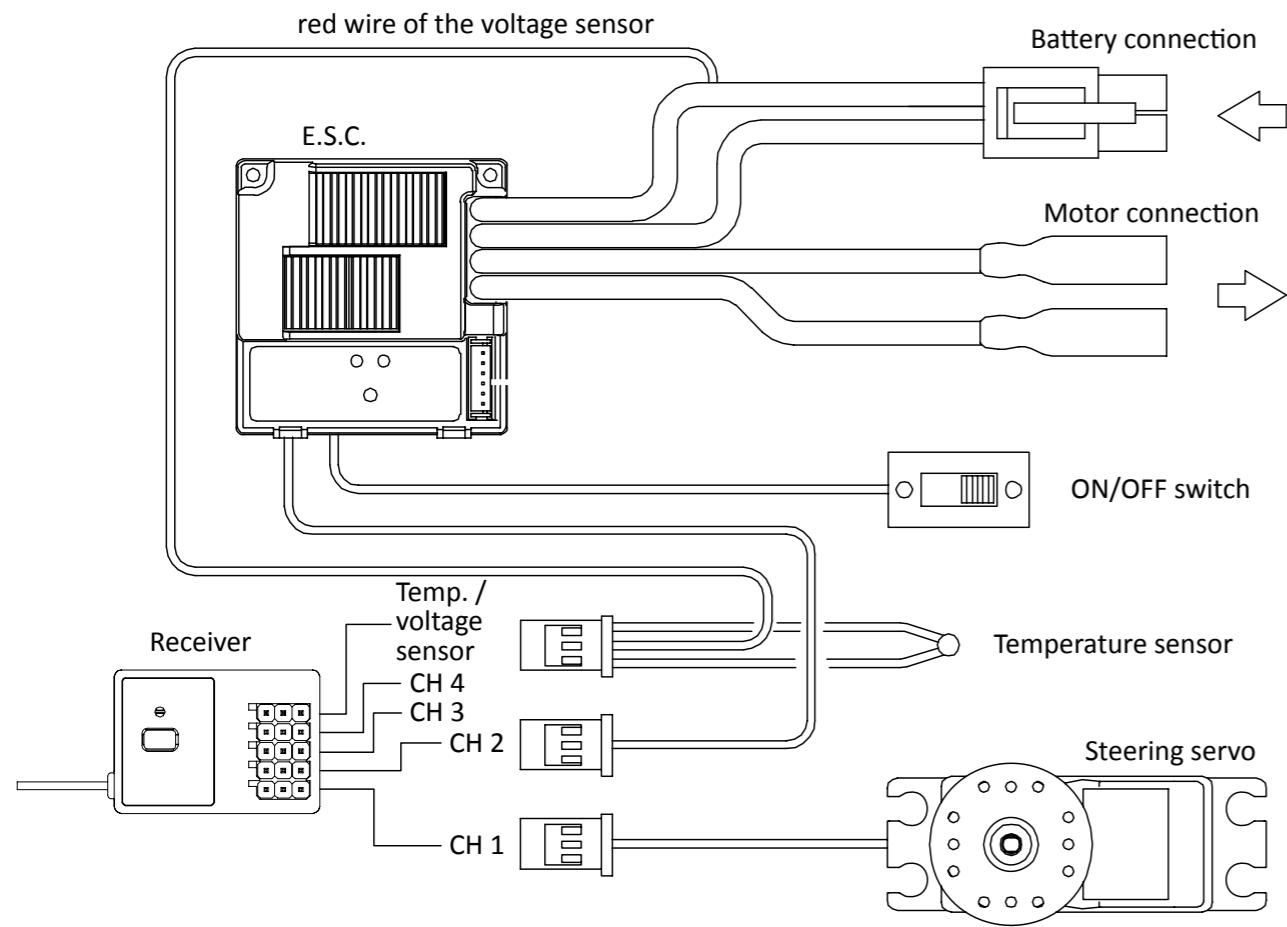


### Attention

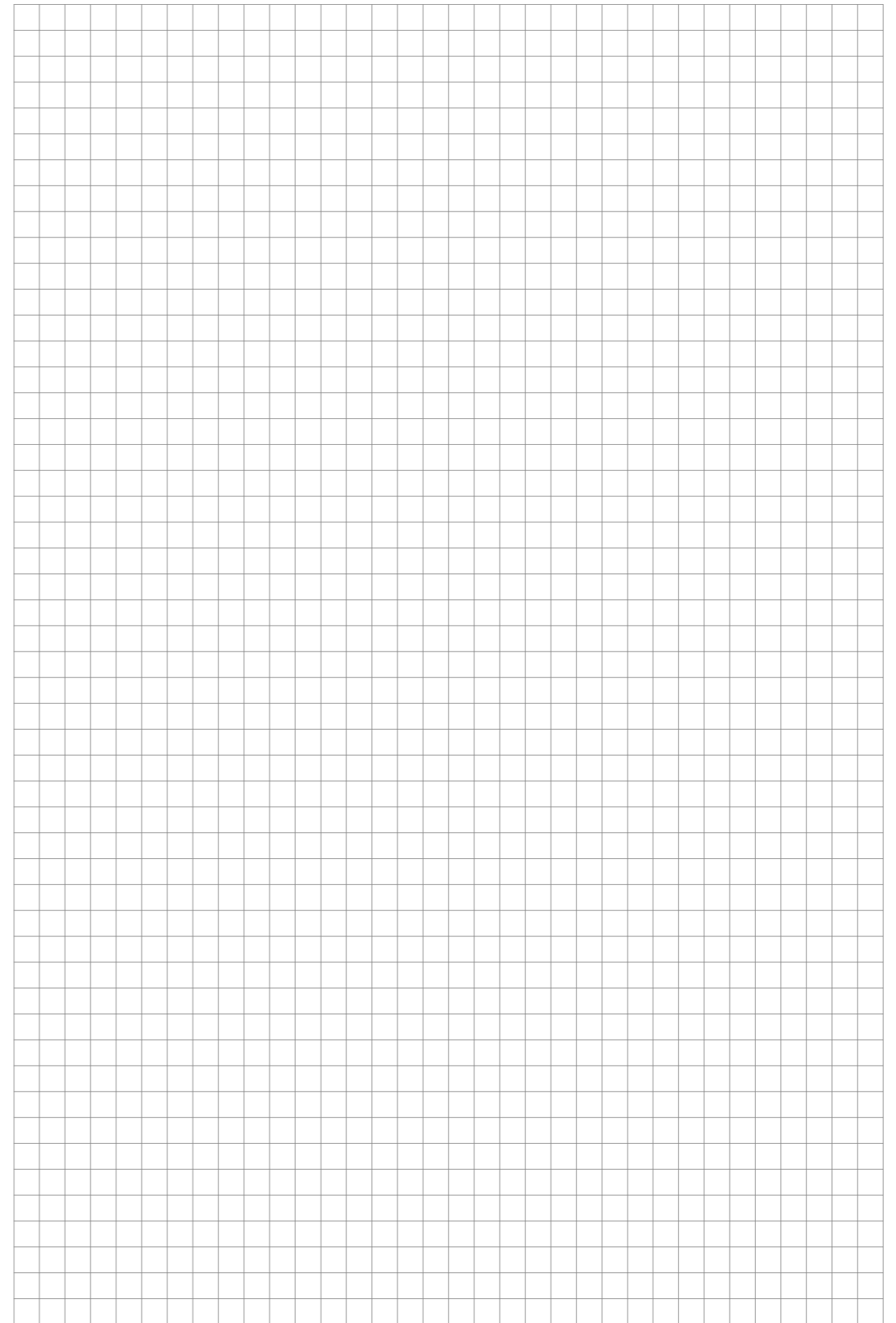
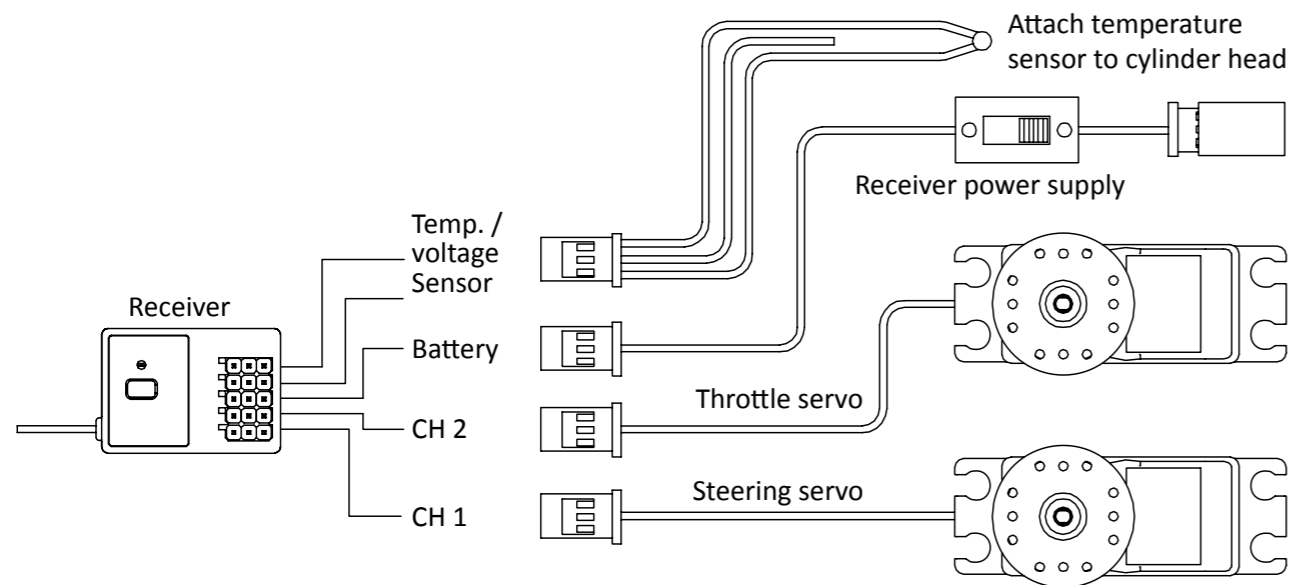
Analogue servos and many digital servos no longer experience resistance to the ongoing control pressure after control pulses stop and are moved out of their position at higher or lower speed.

## Connection example

... for electric driven models



... for model with I.C. engine



## Firmware update



Updates to the receiver's firmware are made via the receiver connection 3 using a PC running Windows 7 ... 10. You will also need a USB interface, No. 7168.6, and adapter lead, No. 7168.S, which are available separately.

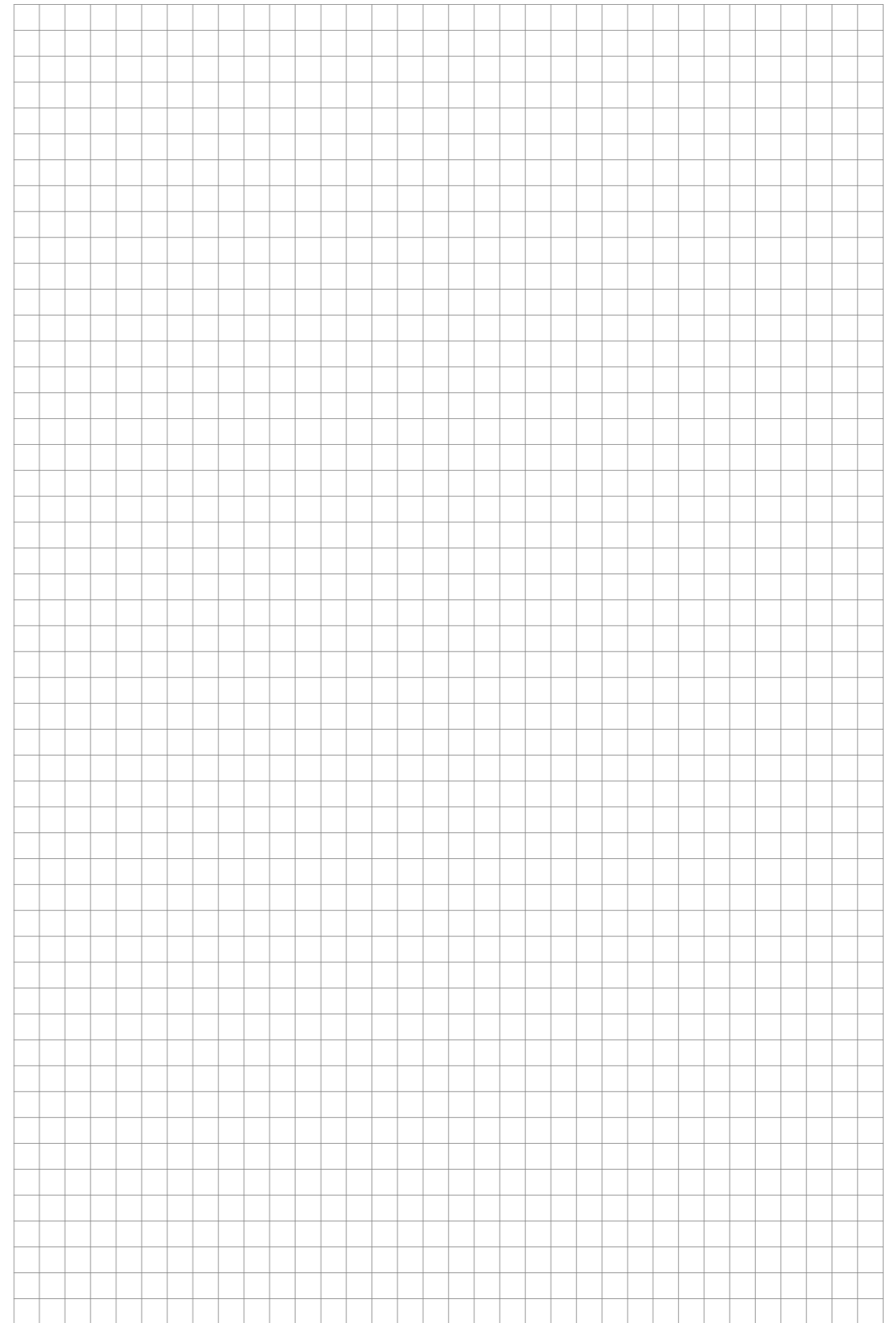
The programs and files required can be found in the Download area for the corresponding products at [www.graupner.de](http://www.graupner.de).

Connect the adapter lead to the USB interface. The polarity of the plug-in system cannot be reversed. Note the small chamfers on the sides. Do not use force, the plug should click into place easily.

Plug the other end of the adapter cable into the **GR-4 HoTT** receiver in the port marked with "B/T" and in the **GR-8 HoTT V2** receiver into the "3 + -" socket. The polarity of the plug-in system cannot be reversed. Do not apply force. The plug should be pushed all the way in with the black or brown wire facing outside the receiver.



The update is carried out via the "HoTT device" program section of the program "Firmware\_Upgrade\_gr\_Studio". Please follow the notes of the software. The further procedure is also described in detail in the manual contained in the data package. You can also download these from the download page of the product at [www.graupner.de](http://www.graupner.de).





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## SIMPLIFIED DECLARATION OF CONFORMITY

**Graupner/SJ** hereby declares that the radio system **33502 GR-4 HoTT** and **33504 GR-8 HoTT V2** comply with the Directive 2014/53/EU.

The full text of the EU Declaration of Conformity is available at the following Internet address: **www.graupner.de**

## Manufacturer

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South Korea

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## Notes on environmental protection

If this symbol is on the product, instructions for use or packaging, it indicates that the product may not be disposed with normal household waste once it has reached the end of its service life. It must be turned over to a recycling collection point for electric and electronic apparatus.

Individual markings indicate which materials can be recycled. You make an important contribution to protection of the environment by utilizing facilities for reuse, material recycling or other means of exploiting obsolete equipment.

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

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## Care and maintenance



The product does not need any maintenance. Always protect it against dust, dirt and moisture.

Clean the product only with a dry cloth (do not use detergent!) lightly rub.

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## Warranty conditions

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

These operating instruction are exclusively for information purposes and are subject to change without prior notification. The current version can be found on the Internet at **www.graupner.de** on the relevant product page. In addition, the company **Graupner/SJ** has no responsibility or liability for any errors or inaccuracies that may appear in construction or operation manuals.

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