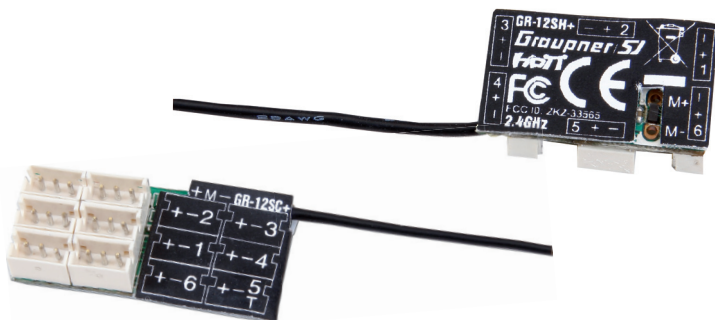


## **Manual**

33565 Receiver GR-12SH+ HoTT

33566 Receiver GR-12SC+ HoTT



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Thank you for purchasing the receiver GR-12SH+ or SC+ for the Graupner HoTT 2.4 System. Please read through this entire manual before you attempt the installation and usage of your Graupner HoTT 2.4 System!

These operating instructions are part of this product. They contain important notes to the operation and handling. Please take this into consideration when you pass on the product to third parties. Neglect of the operating instructions and the safety instructions lead to expiring the warranty.

Graupner constantly work on the advancement of all remote control systems; changes of the scope of delivery in form, technology and equipment we must reserve ourselves therefore. Please have understanding for the fact that from data and illustrations of this operating instructions no requirements can be derived. *Please keep these instructions for further reference!*

### **Intended use**

The receiver is specifically designed for slow-fly models whose components are fitted with SH or ZH connectors. The maximum range is around 300 m, which is appropriate to this type of model. The receiver must not be used in any model which requires greater range, or whose servos draw a current which exceeds the maximum permissible for SH connectors (#33565 max. 0.5 A) or ZH connectors (#33566 max. 1 A).

This product works with any Graupner HoTT 2.4 GHz transmitter, but with no others. If you do not own a Graupner HoTT 2.4 system, the receiver will not function. This product is not compatible with any other 2.4 GHz radio control system. It is not suitable for young people under fourteen years. If a young person below that age wishes to use it, he or she must be supervised by an adult.

Before using the receiver for the first time, please read and observe all the warnings and safety notes in these instructions and on the packaging.

### **WARNINGS**



- Do not connect servos to this receiver whose current drain exceeds the maximum permissible for SH connectors (#33565 max. 0.5 A) or ZH connectors (#33566 max. 1 A).
- If channel 1 is used as an electronic speed controller, the continuous current of the motor connected to it must never exceed 2 A, otherwise the receiver could be ruined!
- If several independent models / receivers are operated close together - e.g. for glider towing - the receivers must be kept a minimum of 50 cm apart, otherwise there is a danger of interaction between them. For the same reason the pilots on the ground should stand at least 5 m apart.

### **1. GENERAL NOTE**

When switching on or adjusting the radio control system it is essential to keep the transmitter aerial at least 15 cm away from the receiver aerials at all times. If the transmitter aerial is too close to the receiver aerials, the receiver will be overloaded, causing the red LED starts flashing. The transmitter responds by emitting a beep once every second; the red LED also goes out. The radio control system is now in Fail-Safe mode.

If this should occur, simply increase the distance between the aerials until the audible warning signal ceases, and the red LED on the transmitter lights up again; at the same time the red LED on the receiver should go out.

### **2. FUNCTIONS**

#### **2.1. Binding**

When you wish to use the Graupner HoTT 2.4 GHz receiver with a particular transmitter, the first step must always be to "bind" the unit to "its" Graupner HoTT 2.4 GHz RF module (transmitter). This "binding" procedure only needs to be carried out once for each combination of receiver and RF module. The units supplied in the set are already bound to each other at the factory, i.e. the binding procedure described in the following section only needs to be carried out when you wish to use an additional receiver. However, it can also be repeated at any time if required, e.g. after changing transmitters. *Please refer to the „BINDING“ section in your RC system or module instructions for the procedure.*

When binding is required, this is the procedure:

- Switch the transmitter and receiver on.
- Unless the receiver has already been bound to the transmitter, it automatically enters BIND mode when initially switched on. If you have already completed the binding procedure for this combination of transmitter and receiver, the red LED on the receiver goes out, and the model can be operated immediately. If the LED does not go out, please follow this procedure:
- **Transmitter with HoTT module:** locate the BIND / RANGE button on the back of the transmitter, and hold it pressed in while you press and hold the SET button on the receiver. Both LEDs on the back of the trans-

mitter now glow constantly, and the red LED on the receiver is on.

**or:** select the transmitter menu „Basic Settings, Model“ and use the ▼▲ arrow keys of the left or right touch pad to move to the screen's „RF bind“ line“. Now start the so-called „receiver binding“ process for the receiver to the currently active model memory by briefly pressing the center **SET** button of the right touch pad. At this time the screen's display will begin to indicate the duration of the „bond“.

- If the red LED of the receiver expires within about ten seconds, this indicates that the binding process is complete. You can now release both buttons, and your transmitter / receiver combination is ready for use.
- However, if the red LED on the receiver continues to flash for longer than ten seconds, then the binding process has failed. If this should occur, repeat the whole procedure.

## 2.2. Fail-Safe function

The receiver supports all transmitter-side fail-safe settings. You can exploit the safety potential of the fail-safe option by at least programming the throttle channel to respond to a fail-safe situation: the throttle channel of an engine-powered model should be set to idle, the throttle channel of an electric-powered model to “stop”, and the throttle channel of a model helicopter to “Hold”. If interference should occur, these settings will help prevent the model flying out of control, possibly causing personal injury or property damage.

*Please refer to the appropriate section in your RC system or module instructions for the procedure.*

## 2.3. Range warning

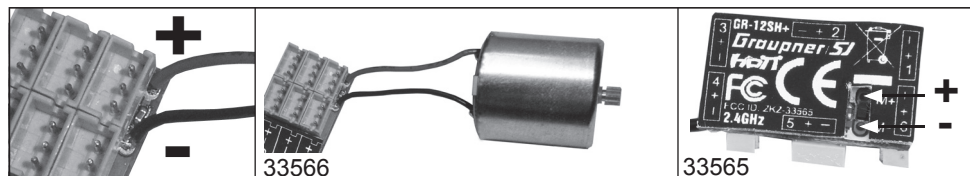
The transmitter always emits an audible range warning in the form of a beep at a rate of about once per second when the receiver signal in the downlink channel becomes too weak. However, since the transmitter operates at much higher power than the receiver, the model can still be controlled safely. In the interests of safety you should nevertheless reduce the distance to the model until the audible signal ceases again. If the audible warning signal continues even when the receiver is (very) close, the transmitter's low-voltage or temperature warning has been triggered! If this should occur, cease operations immediately and recharge the appropriate battery.

## 3. RECEIVER

### 3.1 Connections

Connect the servos to the sockets on the top of the receiver. The SH and ZH connector systems are polarised; check for the small lateral lugs. On no account use force to push the connector in; it should engage easily. The sockets are correctly marked: brown wire (-), red wire (+) and orange (signal).

The servo sockets of Graupner HoTT 2.4 GHz receivers are numbered. Note that a brushed electric motor with a maximum continuous current of 2 A can be connected to channel 1 instead of a servo; in this case the wires should be soldered to the solder pads, as shown in the photo. Channel 1 now operates as an electronic speed controller.



Channel 6 can also be programmed for the HoTT sum signal, if you are using a suitable HoTT transmitter or the SMART-BOX (Order No. 33700). This is important for optional devices which require this signal. In the same way channel 5 can also be programmed for voltage measurement (max. 25.2 V DC), e.g. to monitor the receiver battery - see the point entitled 'Voltage measurement'.

### 3.2 Programming:

The receiver can also be programmed using any suitable HoTT transmitter or the SMART-BOX (Order No. 33700). Five free mixers are available in addition to a number of receiver-specific settings.

### 3.3 Operation

*The receiver set-up menu appears in the "Telemetry" menu under SETUP / DISPLAYS or under SETTING & DATAVIEW if you are using the SMART-BOX. Please read the operating instructions supplied with your transmitter or the Smart-Box to find out how to access this menu.*

**RECEIVER:**

RECEIVER	0.92	< >
►ALARM VOLT:	3.8V	
ALARM TEMP:	70°C	
PERIOD:	20ms	
SUMH at CH6:	No	
VOLTAGE at CH5:	No	
LANGUAGE:	english	

Parameter	Description	Setup
RECEIVER 0.92	0.92 shows the firmware version of the receiver	-
ALARM VOLT.	Alarm threshold of the receiver undervoltage warning	3.0 - 24.0 V factory setting: 3.8 V
ALARM TEMP.	Alarm threshold for excessively high temperature of the receiver	50 - 80° C factory setting: +70° C
PERIOD	Cycle time in ms	10 / 20 ms
SUMH at CH6	Sum signal HoTT at channel 6	Yes / No
VOLTAGE at CH5	Voltage metering at channel 5	-
LANGUAGE	Select menu language	german, english, french, italian and spain

**Low voltage warning (ALARM VOLT):** if the receiver voltage falls below the selected voltage, the transmitter's RF module generates a low voltage warning in the form of a "general alarm sound": a steady beeping at intervals of about one second or the voice announcement „receiver voltage“.

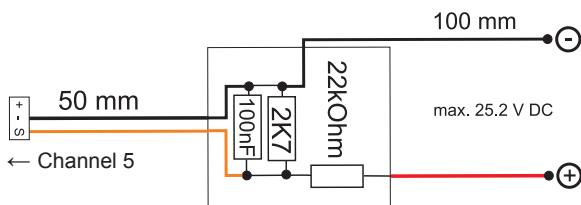
**Temperature warning (ALARM TEMP):** if the receiver temperature falls below the selected temperature, the transmitter's RF module generates a temperature warning in the form of a "general alarm sound": a steady beeping at intervals of about one second or the voice announcement „receiver temperature“.

**Cycle time (PERIOD):** with the use of only digital servos, a cycle time of 10 ms can be set. In mixed operation or with use of only analog servos, 20 ms should absolutely be set, because the latter can otherwise be „overstrained“ and react with „shaking“ or „quivering“ as a result.

**HoTT Sum signal (SUMH):** if the digital HoTT sum signal at channel 6 is activated, the sum signal with up to eight channels is generated at this socket instead of a servo signal. This is important for optional devices which require this signal.

**Voltage measurement (VOLTAGE at CH5):** if voltage measurement at channel 5 is activated, a voltage up to max. 25.5 V DC can be monitored via this input using the circuit described below, instead of a servo. The voltage is then displayed on the screen instead of the receiver voltage. This provides a direct means of monitoring the flight battery without the need for an additional sensor.

**Note: Additional sensors can not be connected to the receiver at the moment!**



## FREE MIXER:

RX FREE MIXER	<
► MIXER:	1
MASTER CH:	1
SLAVE CH:	2
TRIM:	+0%
TRAVEL -:	+100%
TRAVEL +:	+100%

### Important notice:

*If you have already programmed mixer functions in the „Wing mixer“ or „Free mixer“ menu, make absolutely sure that these mixers do not overlap with those in this menu!*

Parameter	Description	Setup
MIXER	Mixer selection	1, 2,...5
MASTER CH	Signal source or source channel	0,1,2,...6
SLAVE CH	Target channel	0,1,2,...6
TRIM	Trim position in %	-15 - + 15%
TRAVEL-	Admix negative	0 - 150%
TRAVEL+	Admix positive	0 - 150%

**MIXER:** Up to five mixers can be programmed simultaneously. Switch between Mixer 1, Mixer 2,... and Mixer 5 through „MIXER“.

The following settings in this display always for just the mixer selected in the „MIXER“ line.

**MASTER CH („from“):** the signal applied at the MASTER CH (signal source or source channel) is mixed to a variable extent to the SLAVE CH (target channel). According to the same principles described in the section „Free mixer“ of the HoTT transmitters.

**SLAVE CH („to“):** The signal of the MASTER CH (source channel) is mixed proportionally to the SLAVE CH (target channel). The degree of mixture is determined by the percentages entered in the lines „TRAVEL-“ and „TRAVEL +“. Select „00“ if no mixer should be set.

**TRAVEL-/+ (proportion of the admix in %):** With the settings of these two lines the percentage of the admix is specified in relation to the MASTER signal separately for each direction.

## 4. FIRMWARE UPDATE GR-12SH+/SC+ RECEIVER

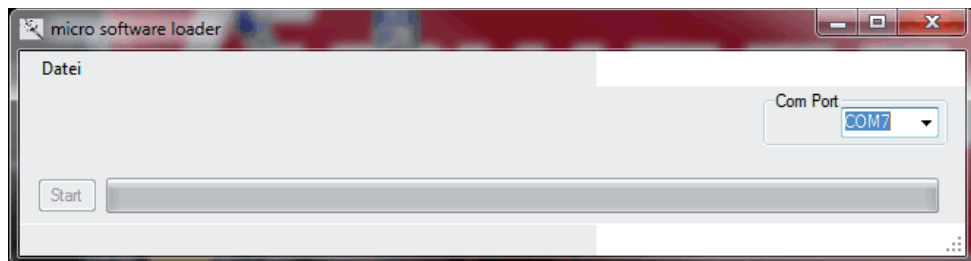
Firmware updates for the receiver can be transferred via the socket „T“ in conjunction with a PC running Windows XP, Vista or 7. For this you also require the USB interface, Order No. 7168.6, and the adapter leads Order No. 7168.S and Order No. 23048 (for 33566), which are available separately.

The program „micro software loader“ and files required for this are available from [www.graupner.de](http://www.graupner.de) in the Download area for the corresponding products.

**Caution:** disconnect all servos from the receiver before carrying out an update, as they could run uncontrollably to one end-point during the procedure, and possibly cause damage to the model.

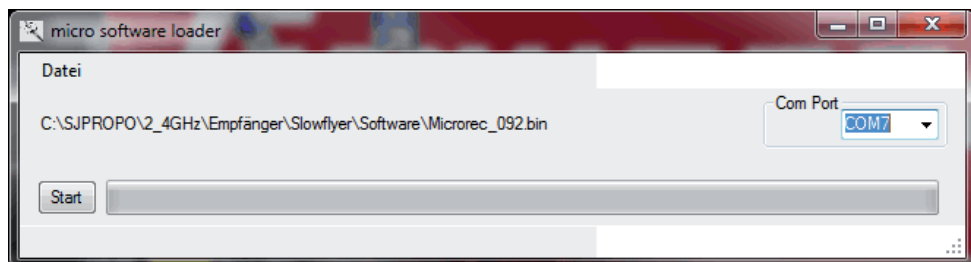
#### 4.1. Update process

Start the program „micro software loader“ with a double-click on the exe-file. Under „Com Port“ select the correct COM port „Silicon Labs CP210x USB to UART Bridge“, i.e. the one to which the USB lead is connected.

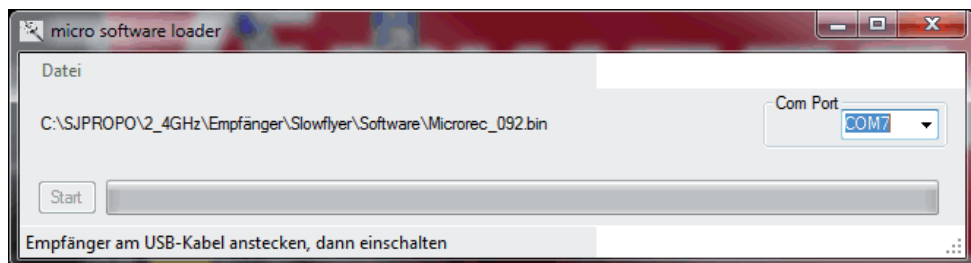


Now click on the „Datei“ button and select the the previously loaded firmware file ending in \*.bin. If everything is correct, the file will appear in the corresponding window.

The firmware files are encoded in product-specific form, i.e. if you accidentally select a file which does not match the product (e.g. transmitter update file instead of receiver file) you will not be able to start the update procedure.



Press the Button „Start“.



Connect channel 5 of the receiver to the USB update cable and then turn it on. The LED expires and the progress-bar shows you the progress of the firmware update. The update is complete when the bar reaches the right end and the red LED on the receiver starts flashing. Because the receiver settings remain after the update, the receiver can be used immediately.

**Specifications GR-12SH/SC+**

Connector type	SH / XH
Operating voltage	(2.5) 3.6 ... 8.4 V
Modulation	2.4 GHz FHSS
Frequency	2400...2483.5
Weight	ca. 1.5 g
Range approx.	800 m

**Konformitätserklärung gemäß dem Gesetz über Funkanlagen und  
Telekommunikationsendeinrichtungen (FTEG) und der Richtlinie 1999/5/EG (R&TTE)**  
Declaration of Conformity in accordance with the Radio and Telecommunications Terminal Equipment  
Act (FTEG) and Directive 1999/5/EG (R&TTE)

Graupner GmbH & Co. KG  
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D-73230 Kirchheim/Teck

erklärt, dass das Produkt:  
declares that the product

**GR-12SH+ HoTT - No. 33565**  
**GR-12SC+ HoTT - No. 33566**

Geräteklasse:  
Equipment class

**1**

den grundlegenden Anforderungen des § 3 und den übrigen einschlägigen Bestimmungen des  
FTEG (Artikel 3 der R&TTE) entspricht.  
complies with the essential requirements of § 3 and the other relevant provisions of the FTEG (Article 3 of the  
R&TTE Directive).

Angewendete harmonisierte Normen:  
Harmonised standards applied

**EN 60950-1:2006+A11:** Gesundheit und Sicherheit gemäß § 3 (1) 1. (Artikel 3 (1)a))  
**2009+A1:2010+A12:** Health and safety requirements pursuant to § 3 (1) 1. (Article 3 (1) a))  
**2011**

**EN 301 489-1 V1.9.2** Schutzanforderungen in Bezug auf elektromagnetische  
**EN 301 489-17 V2.1.1** Verträglichkeit § 3 (1) 2, Artikel 3 (1) b))  
Protection requirement concerning electromagnetic compatibility  
§ 3 (1) 2, Artikel 3 (1) b))

**EN 300 328 V1.7.1** Maßnahmen zur effizienten Nutzung des Frequenzspektrums  
§ 3 (2) (Artikel 3 (2))  
Measures for the efficient use of the radio frequency spectrum  
§ 3 (2) (Article 3 (2))



Kirchheim, 07. August 2012

Stefan Graupner, Geschäftsführer  
Stefan Graupner, Managing Director

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**Tel: 07021/722-0 Fax: 07021/722-188 Email: info@graupner.de**



## ENVIRONNEMENTAL PROTECTION NOTES



When this product comes to the end of its useful life, you must not dispose of it in the ordinary domestic waste. The correct method of disposal is to take it to your local collection point for recycling electrical and electronic equipment. The symbol shown here, which may be found on the product itself, in the operating instructions or on the packaging, indicates that this is the case.

Individual markings indicate which materials can be recycled and re-used. You can make an important contribution to the protection of our common environment by re-using the product, recycling the basic materials or recycling redundant equipment in other ways.

Remove batteries from your device and dispose of them at your local collection point for batteries.

In case of R/C models, you have to remove electronic parts like servos, receiver, or speed controller from the product in question, and these parts must be disposed of with a corresponding collection point for electrical scrap.

If you don't know the location of your nearest disposal centre, please enquire at your local council office.

Garantie von  
warrantied for  
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months  
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D-73230 Kirchheim / Teck

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Montag - Freitag 7:30 -11:45  
und 12:30 -16:00 Uhr

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I 25064 Gussago  
☎ (+39) 30 25 22 73 2

**Garantie-Urkunde**

Warranty certificate / Certificat de garantie

33565 GR-12SH+  
33566 GR-12SC+

Übergabedatum  
Date of purchase/delivery  
Date de remise

Name des Käufers  
Owner's name  
Nom de l'acheteur

Straße, Wohnort  
Complete address  
Adresse complète

Firmenstempel und Unterschrift des Einzelhändlers  
Stamp and signature of dealer  
Cachet et signature du vendeur

[illegible]



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Specifications and availability subject to change. Supplied through specialist model shops only. We will gladly inform you of your nearest supplier. We accept no liability for printing errors.

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