Graupner HoTT

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HoTT 1.0 / Oktober 2010 - EN V1.0

GETTING STARTED   **Graupner HoTT**

Thank you for purchasing 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 contains 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!

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 on the receiver to light up. 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. When binding is required, this is the procedure:
• Switch the transmitter and receiver on.
• 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 transmitter now glow constantly, and the red LED on the receiver flashes.
• Under normal circumstances the flashing red LED on the receiver will cease to flash and switch to a constant green 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.

2.1.1.Binding" multiple receivers in one model
If required, it is also possible to bind multiple receivers to the transmitter for a particular model. The first step is to bind each receiver individually using the procedure already described.
When the system is in use, the receiver which is switched on first is the Master receiver. Any telemetry sensors installed in the model must be connected to this unit, as only the Master receiver transmits sensor data using the downlink channel. The second and all further receivers operate in parallel with the Master receiver but in Slave mode, with the downlink channel switched off.
The control functions can also be distributed amongst multiple receivers; this is carried out using the Channel Mapping function of the SMART-BOX (Order No. 33700). In the same way it is possible to assign one control function to multiple receiver outputs; a typical example would be the use of two servos for each aileron instead of only one, etc.

2.2. Range checking

The method of checking the effective range of the Graupner HoTT 2.4 GHz system is described below. We recommend that you ask a friend to help you with this procedure.

After binding the receiver to your transmitter, switch the transmitter and the receiver on, and wait until the green LED on the receiver lights up.

- Install the bound receiver in the model in its final intended position.
- Switch the RC system on, so that you can observe the movement of the servos.
- Set up the model on a flat surface (pavement, closely mown grass or earth), and ensure that the receiver aerials are located at least fifteen cm above the ground. This may require a support for the model.
- Hold the transmitter at hip-height, away from your body, but do not point the aerial directly at the model; instead turn and / or angle the aerial tip so that it stands vertical, and keep it there for the duration of the range check.
- Locate the BIND / RANGE button on the back of the transmitter, and press it to initiate range-check mode. Hold the button pressed in until the transmitter starts to beep at a regular rhythm; the red and green LEDs adjacent to the BIND / RANGE button now flash alternately.
- Walk away from the model, operating the transmitter sticks constantly. If you detect an interruption in the link within a range of about fifty metres, stand still and attempt to reproduce it.
- If the model is fitted with a motor, switch it on in order to check whether the power system is generating interference.
- Continue to walk away from the model until you reach the point where perfect control is no longer possible.
- Now press the BIND / RANGE button on the transmitter once more; this terminates range-check mode manually, and the model should respond normally to control commands. If this does not occur with 100% reliability, the system should not be used. Contact your local Service Department of Graupner GmbH & Co. KG.
- Range-check mode is usually terminated manually when the user presses the BIND / RANGE but ton, but it terminates automatically after about ninety seconds in any case. The red LED now glows constantly again, while the green LED either glows constantly or flashes continuously, according to the Country setting.
- We recommend that you check effective radio range before every flight. While you are carrying out the check, simulate all the servo movements which will take place when the model is in flight. The ground range must always be at least fifty metres in order to ensure safe, reliable model control.

Note:
Range-check mode is usually terminated manually when the user presses the BIND / RANGE button, but it terminates automatically after about ninety seconds in any case.
CAUTION:
During normal operations (i. e. when controlling a model) never press and hold the programming button on the transmitter module!

2.3. Fail-Safe function

In its default state (as delivered) the receiver is set to "Hold" mode, i.e. if a fail-safe situation occurs, all the servos connected to it maintain the last position detected as valid. In this mode the red LED on the receiver lights up when interference occurs, and the red LED on the transmitter goes out. The transmitter also starts beeping about once per second as an audible warning.

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.
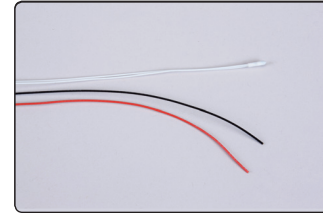**IMPORTANT:**
The two functions "Binding" and "Range check" described above can be used regardless of the method you last employed to program the transmitter, i.e. using the programming button or the SMART-BOX; neither of these two options causes significant changes to the settings saved in the receiver. However,
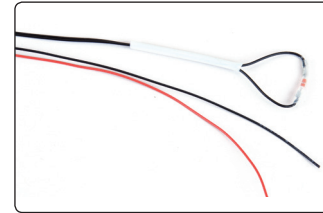
ACCESSORIES:

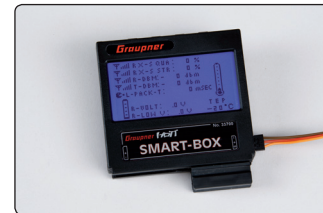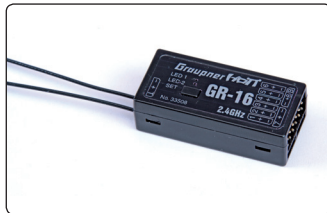|	
Order No. 33611	General Air-Module Graupner HoTT Vario, RPM, Fuel, 2x temperature, 2x voltage, max. current 40A, capacity, single cell voltage 2 -6 S
Order No. 33612	Graupner HoTT Temperature Sensor 120°C, voltage sensor
Order No. 33613	Graupner HoTT Temperature Sensor 200°C, voltage sensor
Order No. 33615	Graupner HoTT RPM Optical Sensor
Order No. 33700	HoTT SMART BOX

ACCESSORIES:
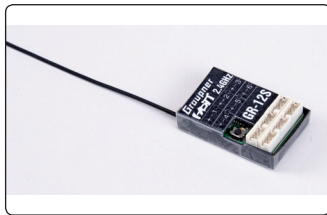
Order No. 33505	Receiver GR-12S HoTT
Order No. 33506	Receiver GR-12 HoTT
Order No. 33508	Receiver GR-16 HoTT
Order No. 33512	Receiver GR-24 HoTT
Order No. 33600	Graupner HoTT GPS/Vario Module

if you call up the Fail-Safe function using the programming button as described below, this resets ALL the settings of the SMART-BOX at the Fail-Safe screen (RX FAIL SAFE) - and this includes the settings available through the facilities of the programming button. At the same time the Country setting will revert to Universal if you have previously selected "France" using the programming button - see below under "2.4". You MUST therefore select the Country setting again if necessary. For this reason, wherever possible it is always best to maintain your programmed settings using the SMART-BOX.

Switch your receiving system on. Locate the BIND / RANGE button on the back of the transmitter, and hold it pressed in while you switch the transmitter on. Release the button again once it is switched on. You can now call up the desired Fail-Safe mode (Fail-Safe on / off, Hold, or Standard) by cycling through the modes with a brief press of the BIND / RANGE button:

• **Fail-Safe mode:** when you press the BIND / RANGE button, the transmitter beeps once; the red and green LEDs glow constantly.
It is now possible to program positions to which the servos will move in a Fail-Safe situation; this occurs after a "Hold" period of 0.75 seconds: move the corresponding transmitter controls (sticks, rotary knobs, INC / DEC buttons etc.) to the desired Fail-Safe positions SIMULTANEOUSLY, then hold the BIND / RANGE button pressed in for three to four seconds. When you release the button, both the red and green LEDs should light up constantly, and the transmitter should not emit an audible signal: the transmitter now reverts to Control mode. If this does not occur, repeat the procedure.

• **Hold mode (recommended for model helicopters):** when you press the BIND / RANGE button, the transmitter beeps twice; the red LED lights up constantly, and the green LED goes out (factory default setting).
If interference occurs, all servos programmed to "Hold" remain at the last position detected by the receiver as correct; this situation is maintained until such time as the receiver picks up a new, valid control signal.
You can save your selection by holding the BIND / RANGE button pressed in for three to four seconds. When you release the button, both the red and green LEDs should light up constantly, and the transmitter should not emit an audible signal: the transmitter now reverts to Control mode. If this does not occur, repeat the procedure.

• **Fail-Safe OFF:** when you press the BIND / RANGE button, the transmitter beeps three times; the green LED glows constantly, the red LED goes out.
You can save your selection by holding the BIND / RANGE button pressed in for three to four seconds. When you release the button, both the red and green LEDs should light up constantly, and the transmitter should not emit an audible signal: the transmitter now reverts to Control mode. If this does not occur, repeat the procedure.

• **Standard mode (suitable for fixed-wing model aircraft only):** when you press the BIND / RANGE button, the transmitter beeps four times; both LEDs are off.
In this mode the throttle servo (channel 1) moves to the Fail-Safe position, i.e. the position you have programmed for a Fail-Safe situation, while all the other channels remain at "Hold".
Move the throttle stick to the desired position, then hold the BIND / RANGE button pressed in for three to four seconds. When you release the button, both the red and green LEDs should light up constantly, and the transmitter should not emit an audible signal: the transmitter now reverts to Control mode. If this does not occur, repeat the procedure.

2.4. Country setting
The Country setting is present in order to cater for various directives (FCC, ETSI, IC etc.). The HoTT 2.4 radio system features a restricted frequency band for France. If you wish to use the RC system in France, the country setting on the transmitter must be set to "France" mode, as described. **It is essential not to use the Universal/EUROPE mode.** If you select the "France" setting on your transmitter, you MUST select it again every time you alter the Fail-Safe settings using the programming button.
To select a Country setting, you must first switch the transmitter off, then insert the (FRANCE / GENERAL) programming plug (supplied) in the DATA socket on the back of the transmitter. Switch the transmitter on: you can now toggle between the "GENERAL" and "France" settings by briefly pressing the BIND / RANGE button, always starting with the current setting.
• **GENERAL/EUROPE:** the transmitter beeps once when you press the BIND / RANGE button, and

the green LED lights up constantly.
Default setting: approved for use in all countries with the exception of France.
- **France:** the transmitter beeps twice when you press the BIND / RANGE button, and the green LED flashes continuously.
- Once you have selected the Country setting, save it in the transmitter by holding the BIND / RANGE button pressed in for about three seconds. When you release the button, the transmitter emits a brief confirmation tune, and the beeps cease.
- Switch the transmitter off, and remove the programming plug. Do not under any circumstances use the radio control system with the programming plug inserted!
- If you subsequently wish to check the current Country setting for the transmitter, observe the green LED on the back of the transmitter when it is switched on:
  green LED glowing constantly = "GENERAL"
  green LED flashing constantly = "France"

2.5.Low voltage warning
If the transmitter voltage falls below 8.0 V, the RF module generates an audible low voltage warning in the form of a steady series of beeps at intervals of around one second. This occurs independently of the transmitter software.

2.6.Range warning
If the receiver signal in the down-link channel becomes too weak, the transmitter always generates an audible range warning in the form of a beep emitted about once per second. Since the transmitter's output is much higher than that of the receiver, you will still maintain full control of the model, but in the interests of safety you should fly the model back towards you until the warning signal ceases again.
If the audible range warning signal does not cease when you reduce the distance, then the transmitter or receiver low voltage or temperature warning is active! In this case you must land the model and cease operations without delay.

2.7.Firmware update or SMART-BOX connection
The SMART-BOX is connected to the DATA socket on the back of the transmitter.
Firmware updates for the transmitter RF module can be transferred via the DATA or telemetry interface 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 lead, Order No. 7168.6A, which are available separately.
The programs and files required for this are available from www.graupner.de in the Download area for the corresponding products.
See also chapter 4.1.

3.   Receiver

Servo sockets

Programming socket
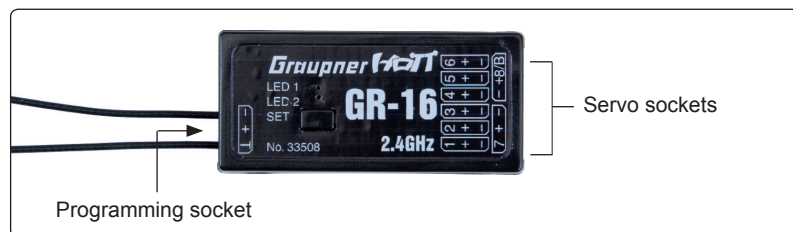
3.1 Connections
Plug the servos into the row of sockets on the right-hand end of the receiver. The connector system is polarised; note the small chamfer on one edge. Never use force - the plugs should engage easily and fully. The socket polarity is also marked on the case: brown wire (-), red (+) and orange (signal).
The servo sockets of the Graupner-HoTT 2.4 receiver are numbered. The socket marked "- +/B" is intended for the battery. If necessary, a servo can be connected to this socket in parallel with the power supply; a Y-lead (Order No. 3936.11) is required for this.

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.

Konformitätserklärung gemäß dem Gesetz über Funkanlagen und Telekomunikationsendeinrichtungen (FTEG) und der Richtlinie 1999/5/EG (R&TTE)

Declaration of Conformity in accordance with the Radio and Telecomunikations Terminal Equipment Act (FTEG) and Directive 1999/5/EG (R&TTE)

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erklärt, dass das Produkt: **No. 4754, No. 4755, No. 33505, No.33506 , No.33508,**
declares that the product   **No. 33512**

Geräteklasse: **2**
Equipment class

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 60950:2006   Gesundheit und Sicherheit gemäß § 3 (1) 1. (Artikel 3 (1)a))
                              Health and safety requirements pursuant to § 3 (1) 1. (Article 3 (1) a))

EN 301 489-1   V1.7.1   Schutzanforderungen in Bezug auf elektromagnetische
EN 301 489-3   V1.4.1   Verträglichkeit § 3 (1) 2, Artikel 3 (1) b))
                              Protection requirement concernig 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, 05. Oktober 2010   Hans Graupner, Geschäftsführer
                                     Hans Graupner, Managing Director

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It is also possible to program the highest channel for the sum signal using the SMART-BOX (Order No. 33700). This is important for certain optional devices which require this signal.

Power supply for receiver 33506, 33508, 33512
When using High Power servos, connect the receiver power supply/s preferably to the vertical ports of the receiver. If necessary, the servos can be connected to this sockets in parallel with the power supply; a Y-lead (Order No. 3936.11) is required for this.
The lower sockets (33508 and 33512) should not be used, because an increased voltage drop occurs.
When using a dual power supply, use the sockets on the outside:
Receiver 33506/33508 (GR-12/GR-16): Channel 1 and 6 (or 2 and 5)
Receiver 33512 (GR-24): Channel 11 and 12

RECEIVER 33508 — Channel 1 and 6 — do not use
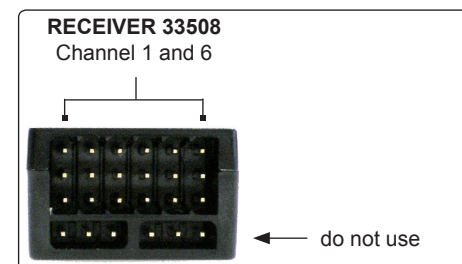
The socket marked "T" - telemetry interface - on the left-hand end of the receiver is intended for the optional telemetry sensors. This socket is also used for loading firmware updates in conjunction with the USB interface. This socket is also polarised; note the small chamfer on one edge. Never use force - the plugs should engage easily and fully. The socket polarity is also marked on the case: brown wire (-), red (+) and orange (T).

3.2. Low voltage warning
If the receiver voltage falls below 3.8 V, 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.

3.3. Temperature warning
If the receiver temperature falls below -10° C or exceeds +70° C, 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.

3.4. Firmware updates
Firmware updates for the receiver can be transferred via the programming socketvia the programming socket on the side of the unit, 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 lead, Order No. 7168.6A, which are available separately.
The programs and files required for this are available from www.graupner.de in the Download area for the corresponding products.
See also chapter 4.2.

4. Firmware update Graupner-HoTT 2.4 Transmitter and receiver

Firmware updates for the transmitter RF module can be transferred via the DATA or telemetry interface 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 lead, Order No. 7168.6A, which are available separately.
The programs and files required for this are available from www.graupner.de in the Download area for the corresponding products.
Install the Firmware Update Utility Graupner and the USB drivers on your computer. Check the system requirements!
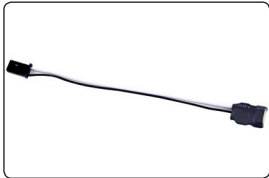
The first step is to cut through the central red wire in the adapter lead, Order No. 7168.6A, then connect the lead to the USB interface, Order No. 7168.6. This socket is also polarised; note the small chamfer on one edge. Never use force - the plug should engage easily and fully.

4.1. Transmitter

Connect the adapter lead to the DATA socket on the back of the trans-mitter, as shown in the illustration. This socket is also polarised; note the small chamfer on one edge. Never use force - the plug should engage easily and fully.
The socket polarity is also marked on the case: the black wire (-) must be at the bottom, the white wire (S) at the top.

4.2. Receiver

Connect the adapter lead to the socket on the left-hand end of the recei-ver, as shown in the illustration. This socket is also polarised; note the small chamfer on one edge. Never use force - the plug should engage easily and fully.
The black wire (-) must be at the front, the white wire (T) at the back.
Note: Updates for the receiver 33506 can only be done with the help of the SMART-BOX (Order No. 33700). Please read the instructions for the SMART-BOX!

4.3. Update procedure

Ensure that the adapter lead is configured as shown in the illustrations, and is connected correctly to the transmitter or receiver.
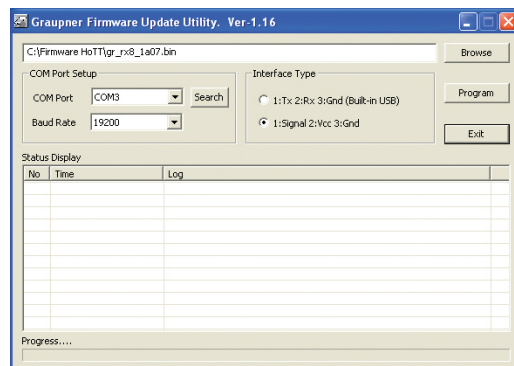
Start the Graupner Firmware Update Utility.
Under [COM Port Setup] select the correct COM port, i.e. the one to which the USB lead is con-nected. If you are not sure of this, open WIN-DOWS System Control / System / Hardware / Device Manager. Under Ports select "Silicon Labs CP210x USB to UART Bridge" and read off the port it is using.

Under [Interface Type] click on Signal 2:Vcc:Gnd.
Now click on the "Browse" button and select the folder containing 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), then the pop-up window "Pro-duct code error" will appear, and you will not be able to start the update procedure.
Press the "Program" button in the software.
Transmitter: press the BIND / RANGE button, and switch the transmitter on while you hold it pressed in.
Receiver: press the SET button, and switch the receiver on while you hold it pressed in.

After a few seconds the Status screen displays the message "Found target device…"; you can now release the button, and the firmware update process commences.

If the device is not recognised, if the pop-up window "Found not target device ID" appears, or if the process fails before 100% is reached, you must restart the update procedure. Repeat all the steps as described above.

The Status display and the Progress bar show the progress of the firmware update. The update is com-pleted when the message "Successfully…100%" or "Successfully Done!!" appears.

During the update process both LEDs on the transmitter glow constantly. When it is complete, the red LED goes out and you will hear a brief confirmation melody. Both LEDs on the receiver also light up; when the process is complete, the green LED goes out, and the red LED starts flashing.

Switch your transmitter / receiver off, and disconnect the adapter lead.

Caution: after completing an update process, you must initialise the device before using it, i.e. reset it to the factory default values,.

Initialisation:
Transmitter: To initialise the system, i.e. to reset it to the factory default settings, locate the BIND / RANGE button on the back of the transmitter, hold it pressed in while you switch the transmitter on, then release the BIND / RANGE button again.
Receiver: To initialise the system, i.e. to reset it to the factory default settings, locate the BIND / RANGE button on the back of the transmitter, hold it pressed in while you switch the transmitter on, then release the BIND / RANGE button again. Now immediately press and hold the SET button on the receiver, switch it on, and release the SET button again. After about two or three seconds the green LED on the receiver lights up to confirm that your radio control system has been re-initialised.
Please note:
The initialisation procedure erases ALL the settings you have entered. Where necessary, you will need to program your preferred settings again.

When initialisation is complete, the transmitter will be in Fail-Safe set-up mode. You can therefore imme-diately continue by programming your fail-safe settings.
If you previously set your transmitter's Country setting to "France" mode, you must also re-enter the Country setting.
Please refer to the appropriate section in your RC system instructions for the procedure.

Any settings you have entered using the SMART-BOX are also lost when you initialise the recei-ver. If you carry out a receiver firmware update, you will need to re-enter these settings.