



Manual

Brushless Control#T

**Controller with internal HoTT
telemetry for brushless motors**

- 33718 BRUSHLESS CONTROL +T 18 BEC JR
- 33718.SC BRUSHLESS CONTROL +T 18 BEC SC
- 33718.SH BRUSHLESS CONTROL +T 18 BEC SH
- 33735 BRUSHLESS CONTROL +T 35 G 3,5
- 33735.G2 BRUSHLESS CONTROL +T 35 G2
- 33745 BRUSHLESS CONTROL +T 45 G3,5
- 33745.G2 BRUSHLESS CONTROL +T 45 G 2
- S3046 BRUSHLESS CONTROL +T 50 G 3,5
- 33760 BRUSHLESS CONTROL +T 60 G 3,5
- S3031 BRUSHLESS CONTROL +T 60,Opto, D 3,5
- S3040 BRUSHLESS CONTROL +T 60, HV, D 3,5
- 33770 BRUSHLESS CONTROL +T 70 G 3,5
- 33770.D35 BRUSHLESS CONTROL +T 70 D3,5 XT-60
- S3041 BRUSHLESS CONTROL +T 80, HV, D 3,5
- S3042 BRUSHLESS CONTROL +T 80,Opto, D 3,5
- S3030 BRUSHLESS CONTROL +T 100, G 6
- S3036 BRUSHLESS CONTROL +T 100, HV, G 6
- S3037 BRUSHLESS CONTROL +T 100, Opto, G 6
- S3038 BRUSHLESS CONTROL +T 120, HV,G 6
- S3032 BRUSHLESS CONTROL +T 120,Opto, G 6
- S3033 BRUSHLESS CONTROL HV +T 160, Opto G6
- S3039 BRUSHLESS CONTROL HV +T 160, G6
- S3064 BRUSHLESS CONTROL HV +T 160 COOL





33718 BRUSHLESS CONTROL +T 18 BEC JR
 33718.SC BRUSHLESS CONTROL +T 18 BEC SC
 33718.SH BRUSHLESS CONTROL +T 18 BEC SH



33735 BRUSHLESS CONTROL +T 35 G 3,5
 33735.G2 BRUSHLESS CONTROL +T 35 G2
 S3046 BRUSHLESS CONTROL +T 50 G 3,5



33745 BRUSHLESS CONTROL +T 45 G3,5
 33745.G2 BRUSHLESS CONTROL +T 45 G 2



33760 BRUSHLESS CONTROL +T 60 G 3,5



33770 BRUSHLESS CONTROL +T 70 G 3,5
 33770.D35 BRUSHLESS CONTROL +T 70 D3,5 XT-60



S3030 BRUSHLESS CONTROL +T 100 G 6



S3031 BRUSHLESS CONTROL +T 60,Opto, D 3,5
 S3040 BRUSHLESS CONTROL +T 60, HV, D 3,5



S3041 BRUSHLESS CONTROL +T 80, HV, D 3,5
 S3042 BRUSHLESS CONTROL +T 80,Opto, D 3,5



S3036 BRUSHLESS CONTROL +T 100, HV, G 6
 S3037 BRUSHLESS CONTROL +T 100, Opto, G 6



S3038 BRUSHLESS CONTROL +T 120, HV,G 6
 S3032 BRUSHLESS CONTROL +T 120,Opto, G 6



S3033 BRUSHLESS CONTROL HV +T 160, Opto G6
 S3039 BRUSHLESS CONTROL HV +T 160, G6

Contents

Preamble	5
Symbols and their meanings.....	5
Intended usage	6
Available Telemetry Information	6
Set contents	7
Specification	7
Safety notes	8
Environmental protection notes	11
Care and maintenance	11
Connecting the speed controller BRUSHLESS CONTROL +T 18 - 100.....	12
Connecting the speed controller BRUSHLESS CONTROL+T 60 - 160, HV	12
Connecting the speed controller BRUSHLESS CONTROL HV+T 60 - 160, Opto.....	13
Side connections of the BRUSHLESS CONTROL+T 60-160, HV	13
Installing in the model, first use.....	14
Calibrating the transmitter travels for full-throttle and motor off	14
Calibrating the transmitter travels for full-throttle - neutral - brake (or reverse)	15
LED status during operation	15
Settings - Programming.....	15
Setting the motor brake on surface, boat and vehicle models	23
ESC Data View	24
Setup structure - Programming warning thresholds	24
Graphic display of telemetry data.....	27
Firmware Update	28
Declaration of conformity	30
Notes.....	31
Warranty	32

English

Preamble

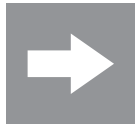
Thank you for choosing a *Graupner* **Brushless Control+T speed controller**. This controller is extremely versatile and can be used by both beginners and experts.

Please read this manual carefully, to achieve the best results with your speed controller, and especially to steer your models safely. If any difficulties arise during use, consult the manual, contact your dealer, or contact the *Graupner* Service Center.

Due to technical changes, the information within this manual may be changed without prior notification.

This product complies with the national and European legal requirements.

To maintain this condition and to ensure safe operation, you, as the user, must read and observe this operating manual and the safety instructions, before using it for the first time!



NOTE

This operating manual is a part of this product. It contains important instructions on first use and handling. Therefore, please keep this operating manual for

future reference! Make sure that this is complied with when passing on this product to third parties.

All company names and product names herein are trademarks of their respective owners. All rights reserved.

If you have technical questions, please contact our service, see page 32.

Symbols and their meanings

	ATTENTION! You must read these instructions in full before using the speed controller for the first time.
	Please comply with the instructions on disposal and environmental protection on page 11

	ATTENTION This symbol emphasizes the adjoining or following information that the user must observe! If these emphasized instructions are not followed, safe functioning and the safety of the operator might be impaired.
	WITHOUT a specific heading, this symbol indicates adjoining or subsequent information or advice that the user should strictly observe! If these instructions and suggestions are not followed, damage of any kind can result.
	WARNING This symbol calls attention to prohibitions which must be strictly observed by the user! Any disregard for the accompanying prohibitions can impair functionality and impair the safety the operator.
	CARE AND MAINTENANCE This symbol calls attention to notices regarding care and maintenance of the product which should be strictly observed by the operator, in order to ensure a long service life for the product
	NOTE This symbol calls attention to notices which should be strictly observed by the operator to ensure safe operation of the device.
	TIP This symbol calls attention to tips and expertise on how to avoid potential difficulties or damage, and is an aid for solving potential problems.
	DISPOSAL NOTE This symbol calls attention to the following notices on how individual materials and products must be disposed of by the user!

Intended usage

The BRUSHLESS CONTROL +T controls the rotational speed of a brushless electric motor connected to it. Precise information regarding your speed controller and suitable motors can be found under Point 11 in the Specification. The BRUSHLESS CONTROL +T is designed exclusively for use in radio-controlled models powered by dry or rechargeable batteries; no other type of use is permitted. Using the controller incorrectly, or for any purpose other than that described, invalidates our guarantee. In such cases we accept no liability.

The unit also features a telemetry function, although this is only available in conjunction with a Graupner/SJ HoTT 2.4 system.

If you do not have the Graupner/SJ HoTT 2.4 radio system the telemetry function will not work. Please read through this entire manual before you attempt the installation and usage of your BRUSHLESS CONTROL +T!

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/SJ 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!

- **BRUSHLESS CONTROL +T features**
- Fully proportional forward with on/off brake and reverse
- Smooth throttle response
- Perfect compatible with both inrunner and outrunner motors without setting.
- Motor rotation direction can be set.
- Li-Po, NiCd and NiMH battery compatible
- Selectable model type (Air, Heli, Boat, Car)
- Brake programmable
- Governormode ON / OFF with Governor Speed (only heli)
- Oneway or twoway (Boat and car)
- Automatically sets low-voltage cutoff based on input voltage
- 32 kHz switching frequency
- Thermal cutoff
- Auto store on the stick Position
- adjustable motortiming

Available Telemetry Information

Telemetry screen:

- Battery voltage, minimum voltage
- ESC temperature, maximum ESC temperature
- Current, maximum current (**except 33718, 33718.SC, 33718.SH**)
- BEC voltage, minimum BEC voltage
- RPM, maximum RPM
- Used capacity (**except 33718, 33718.SC, 33718.SH**)

Programmable warning thresholds for battery voltage, BEC voltage, current consumption, capacity and ESC temperature (**Power consumption and capacity not in 33718, 33718.SC, 33718.SH**)

Set contents

- Brushless Control+T controller
- Capacitor for BEC voltage stabilization (note chapter „Installing in the model, first use“)
- Manual

Specification

	BRUSH- LESS CON- TROL +T 18 #33718	BRUSH- LESS CON- TROL +T 35 #33735	BRUSH- LESS CON- TROL +T 45 #33745	BRUSH- LESS CON- TROL +T 50 #S3046	BRUSH- LESS CON- TROL +T 60 #33760	BRUSH- LESS CON- TROL +T 70 #33770	BRUSH- LESS CON- TROL +T 100 #S3030	BRUSH- LESS CON- TROL +T 60 Opto #S3031	BRUSH- LESS CON- TROL +T 60HV #S3040
Cell count (LiPo)	2 - 4	2 - 6	2 - 6	2 - 6	2 - 6	2 - 6	2 - 6	5 - 12	5 - 12
Operating voltage	6 - 16,8V DC	6 - 25V DC	6 - 25 V DC	6 - 25 V DC	6 - 25 V DC	6 - 25 V DC	6 - 25 V DC	16 - 50 V DC	16 - 50V DC
Cont. current	18 A	35 A	45 A	50A	60 A	70 A	100 A	60 A	60 A
PWM frequency	32 kHz	32 kHz	32 kHz	32 kHz	32 kHz	32 kHz	32kHz	32 kHz	32 kHz
BEC cont. current	2 A	2 A	3 A	3A	3 A	3 A	3 A	-	5 A
BEC max. current	3 A	3 A	10 A	6A	10 A	10 A	10 A	-	15 A
BEC voltage	5,6V	5.0...8,0 V*	5.0...8,0 V*	5.0...8,0 V*	5.0...8,0 V*	5.0...8,0 V*	5,0...8,0 V*	-	5,0...8,0 V*
False start protection	yes	yes	yes	yes	yes	yes	yes	yes	yes
Overtemp. protection	yes	yes	yes	yes	yes	yes	yes	yes	yes
Low voltage cutoff	yes	yes	yes	yes	yes	yes	yes	yes	yes
updatetable firmware	yes	yes	yes	yes	yes	yes	yes	yes	yes
Dimensions (mm) Lenght without capacitor	38x23x8	40x26 x10	55 x 30 x 10	48x26 x8,5	55 x 30 x 10	55 x 30 x 10	40x25 x9,5	87x36 x21	87x36 x21
Weight (with cable)	16 g	44 g	66 g	50g	69 g	73 g	75 g	118 g	118 g

	BRUSH- LESS CONTROL +T80 Opto #S3042	BRUSH- LESS CONTROL +T 80 HV #S3041	BRUSH- LESS CONTROL +T 100 Opto #S3037	BRUSH- LESS CONTROL +T 100 HV #S3036	BRUSH- LESS CONTROL +T 120 Opto #3032	BRUSH- LESS CONTROL +T 120 HV #S3038	BRUSH- LESS CONTROL +T 160 Opto #S3033	BRUSH- LESS CONTROL +T 160 HV #S3039 #S3064
Cell count (LiPo)	5 - 12	5 - 12	5 - 12	5 - 12	5 - 12	5 - 12	5 - 12	5 - 12
Operating voltage	16 - 50V DC	16 - 50V DC	16 - 50V DC	16 - 50V DC	16 - 50V DC	16 - 50V DC	16 - 50V DC	16 - 50V DC
Cont. current	80 A	80 A	100 A	100 A	120 A	120 A	160 A	160 A
PWM frequency	32 kHz	32 kHz	32 kHz	32 kHz	32 kHz	32 kHz	32 kHz	32 kHz
BEC cont. current	-	5 A	-	5 A	-	5 A	-	5 A
BEC max. current	-	15 A	-	15 A	-	15 A	-	15 A
BEC voltage	-	5.0...8,0 V*	-	5.0...8,0 V*	-	5.0...8,0 V*	-	5.0...8,0 V*
False start protection	yes	yes	yes	yes	yes	yes	yes	yes
Overtemp. protection	yes	yes	yes	yes	yes	yes	yes	yes
Low voltage cutoff	yes	yes	yes	yes	yes	yes	yes	yes
updatetable firmware	yes	yes	yes	yes	yes	yes	yes	yes
Dimensions (mm) Lenght without capacitor	87x36x21	87x36x21	87x36x21	87x36x21	87x36x27	87x36x27	87x36x27	87x36x27
Weight (with cable)	118 g	118 g	118 g	118 g	165 g	165 g	165 g	165 g

Safety notes



In the event of damages caused by failure to observe these operating instructions, the guarantee/warranty expires. We do not accept any liability for consequential damages!

In case of material damage or personal injury resulting from improper use or non-observance of the safety instructions, we accept no liability! In such cases, the guarantee/warranty expires.

You have purchased a speed controller, which, together with the required accessories and a functioning RC model, can be used for remote control operation. Graupner/SJ GmbH is not able to monitor the compliance with the installation and operating instructions as well as the conditions and methods used for installation, operation, use and maintenance of the remote control components. Therefore, Graupner/SJ GmbH does not accept any liability for loss, damage or costs arising from improper behaviour as well as improper use and operation or which are related to this in any way. Unless mandated by prevailing law, the

obligation of Graupner/SJ GmbH to provide damage compensation arising from the use of the product, regardless of the reason, is excluded (this exclusion includes personal injury, death, damage to buildings or structures as well as sales and business losses, consequential damage due to business interruption or other direct or indirect consequential damages). Joint liability under all circumstances and in each case is limited to the amount you actually paid for this product.

Also excluded from guarantee and warranty are normal wear during operation (e. g. worn gears or servo gearboxes) and accidental damages (e. g. broken axles or other damages).

The safety instructions do not only serve as a protection of the product, but also for your safety and that of other persons. Therefore, please read this chapter carefully, before you use the product for the first time!

General

Before starting remote control operation, you must inform yourself about the legal provisions, since it is subject to the applicable laws. You must always observe the laws. In this respect, pay attention to the laws applicable in the respective country.

A liability insurance is recommended and mandatory for all types of aircraft models. If you already have one, please inform yourself if the operation of the respective model is covered by your insurance. If this is not the case, conclude a special liability insurance policy for models.

This product is not a toy. It is not suitable for children under 14 years of age.

If you have not yet sufficient knowledge about handling radio-controlled models, please contact an experienced model enthusiast or a model-making club.

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

The product must not become damp or wet. Never operate it in adverse weather conditions, such as rain, storm, strong wind, etc.

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

If you have questions which cannot be answered by the operating manual, please contact us (contact information see page 32) or another expert in the field.



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

Instructions and warnings

Technical defects of an electrical or mechanical nature may cause motors to start without warning, or may generate flying parts which can cause significant injury to you and others!

It is imperative to avoid short-circuits of any kind! Short-circuits can destroy parts of the remote control system and cause serious burns or explosions depending on the circumstances and the battery charge status.

All parts driven by the motor such as air and water propellers as well as helicopter rotors, exposed gears, etc. always pose an injury hazard. Never touch these parts! A fast-rotating propeller can, for example, cut off a finger!

Make sure that no other objects come into contact with driven parts!

Once the battery is connected or the motor is running, always maintain a safe distance from the hazard area posed by the propulsion system!

Also while programming, make sure that a connected electric motor cannot accidentally start. Dis-

connect the drive battery beforehand.

Protect all equipment from dust, dirt, moisture and other foreign parts. All equipment must be protected from vibration as well as excessive heat or cold. The models may only be operated remotely under „normal“ outside temperatures, i.e. from -10°C to +55°C.

Avoid any impact and pressure load. Always check the devices on damage to the housing and cables. Devices that have become wet or damaged must not be used anymore, even if they have dried out!

Only the components and accessories recommended by us are allowed to be used. Always use matching, original *Graupner* plug-in connections of the same design and material.

When routing the cables, make sure that they are not under tension, excessively kinked, or broken. Sharp edges can also damage the insulation.

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

The devices must not be modified in any way. Modifications will void the type approval and any insurance coverage. If necessary, send the relevant device to the responsible *Graupner* service; see page 32.

Warnings



The CE certificate of the speed controller does not release from the obligation to exercise extreme caution.

If the motor does not start as desired, or in case of a crash, immediately set the transmitter stick in motor position off, in order to avoid an overload of the speed controller.

Check the correct connection of the motor again, perhaps shorten the cables and, if necessary, set a time delay for the throttle response at the transmitter, in order to avoid timing errors.

Only use motors from GM-Racing or Graupner/SJ, which are designed for the used voltage range! Only use high performance batteries from GM-Racing or Graupner/SJ. If the internal resistance of the batteries is too high, the speed controller can be destroyed! Never use a power supply unit as a power supply!

Never leave your RC model unattended, as long as the battery is connected. In case of a malfunction, this could cause fire at the model or in its surroundings.

The speed controller or other electronic components must never come into contact with water. Protect the speed controller from dust, dirt, moisture, vibration and other foreign parts.

Never run the motor with a separate battery. This destroys speed controller and motor and voids the warranty.

Never reverse the polarity of your speed controller. Use polarity-safe plug-in systems. Avoid short-circuits and blocking motors.

All cables and connections must be well insulated. Short-circuits can destroy your speed controller. The speed controllers are only intended for use in radio-controlled models that are driven by batteries or rechargeable batteries. Any other use is not permitted. The use in a model for passenger transport is prohibited!

Motors, gearboxes and propellers for boats and aircraft are dangerous objects. Therefore, never get next to or in front of the danger zone of the driving mechanism!

Technical defects of mechanical or electrical parts can cause the motor to start inadvertently and lead to flying parts, which can cause serious injuries.

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.

No modifications whatsoever may be made to the speed controller, unless they are described in the instructions.

Only the components and accessories recommended by us are allowed to be used. Always use matching, original GRAUPNER/SJ plug-in connections and accessories.

Before each start-up and before you plug in the speed controller, make sure that: your transmitter

is switched on and that the throttle lever is set to the position STOP.

Disclaimer: Graupner/SJ is not able to monitor the compliance with the installation and operating instructions as well as the conditions and methods used for installation, operation, use and maintenance of the speed controller.

Therefore Graupner/SJ does not accept any liability for loss, damage or costs arising from improper use and operation or which are related to it in any way.

Environmental protection notes



The symbol on this product, its operating instructions or packaging gives notice that this product may not be discarded as common household waste at the end of its service life. It must be turned over to a recycling collection point for electric and electronic apparatus. The materials can be recycled according to their markings. 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 with local authorities about the responsible waste collection locations.

Care and maintenance



CARE INSTRUCTION

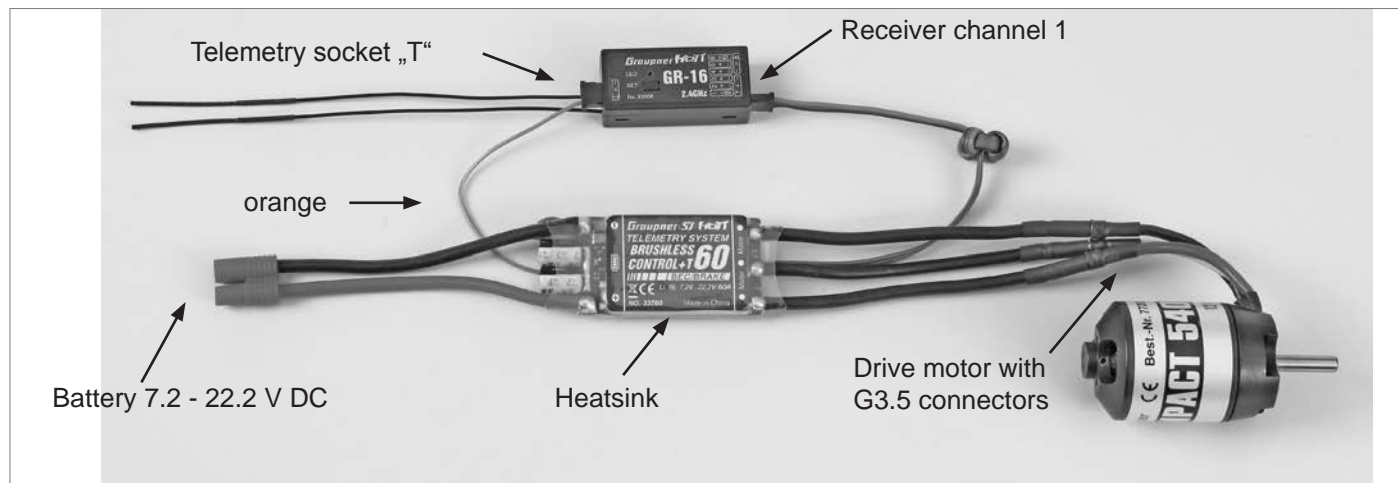
The controller is entirely maintenance-free and therefore requires no servicing of any kind. However, it is in your own interests to protect the controller from dust, dirt and moisture.

To clean the controller, disconnect it from the battery pack and gently wipe it clean with a dry cloth only (do not use any cleaning agents).

Connecting the speed controller BRUSHLESS CONTROL +T 18 - 100

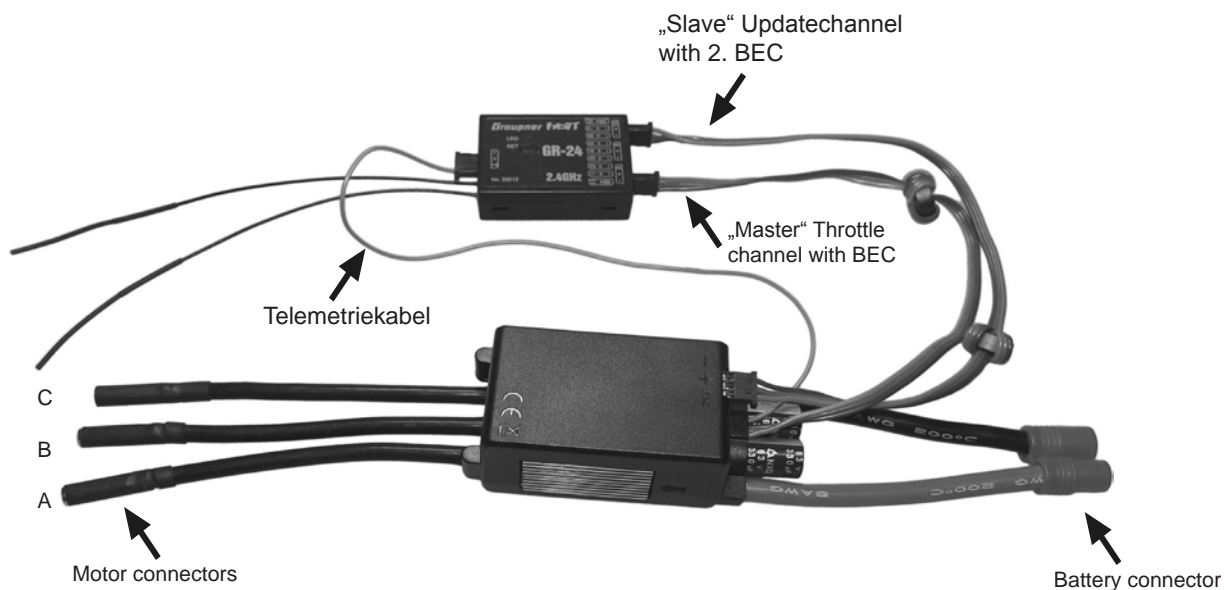
Battery leads may be supplied with different connector systems. You can avoid this problem by always using Graupner/SJ batteries fitted with matching connectors. The maximum length of the flight battery leads is 20 cm. The motor is connected to the speed control of the three black cord. The cables are equipped with jacks. Therefore, should be attached to the engine the right plug. The motor cable can alternatively be soldered directly.

English



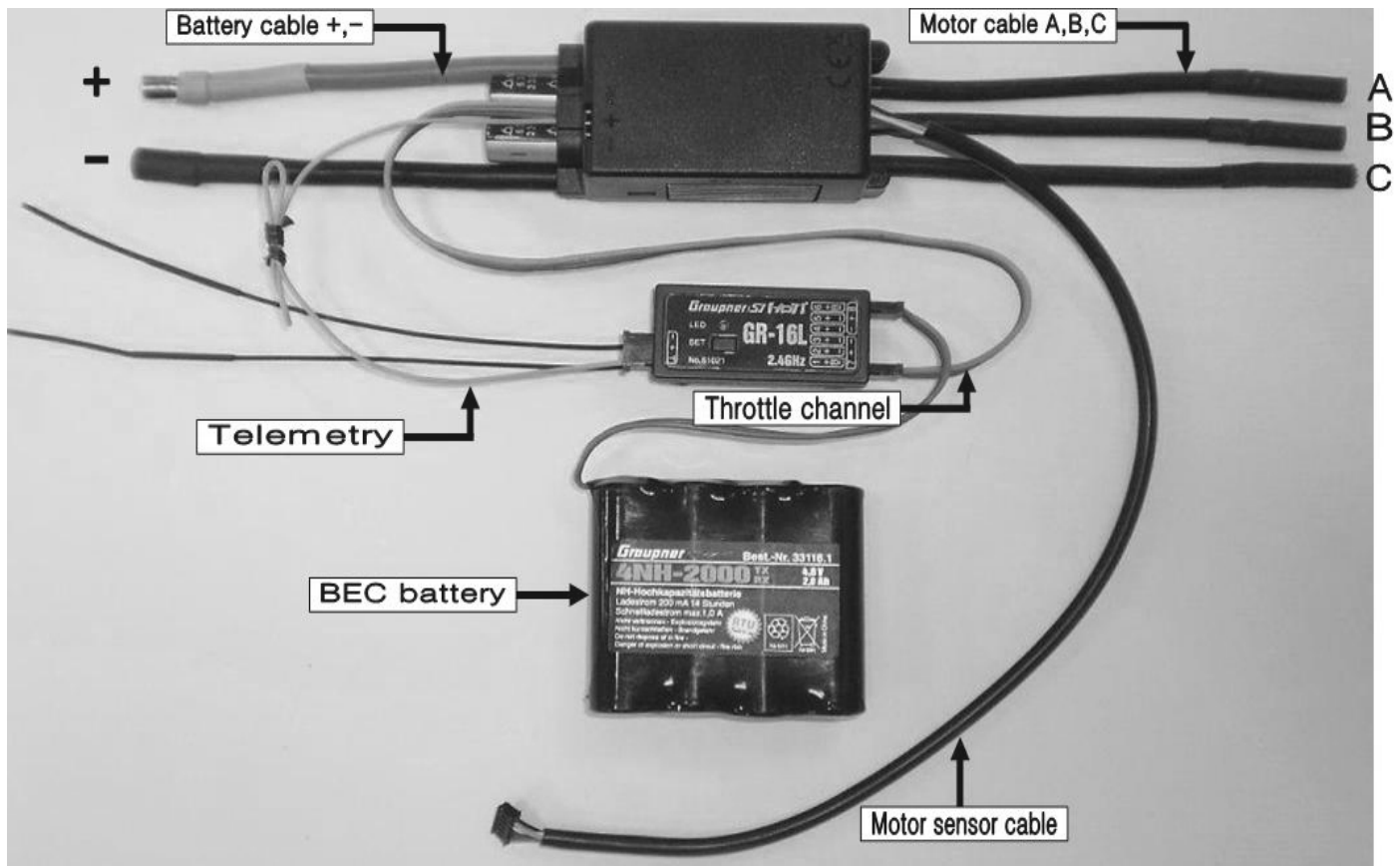
Connecting the speed controller BRUSHLESS CONTROL+T 60 - 160, HV

The speed controller provides stable voltage supply to the receiver with BEC continuous current rating of 5A and peak power load of 15 A. In order to achieve the optimum power, the speed controller is equipped with two BEC connectors. The „master“ connection must be connected to the throttle channel of the receiver. The „slave“ connection is the second BEC power supply and comes with a free channel of the receiver, use this best each of the outer terminals (Bat. port), or a flybarless system, etc. connected. The „slave“ connection is also to be used for the update cable. To update, you proceed as described in Chapter „firmware update“ before, but differing use the „slave“ connection.



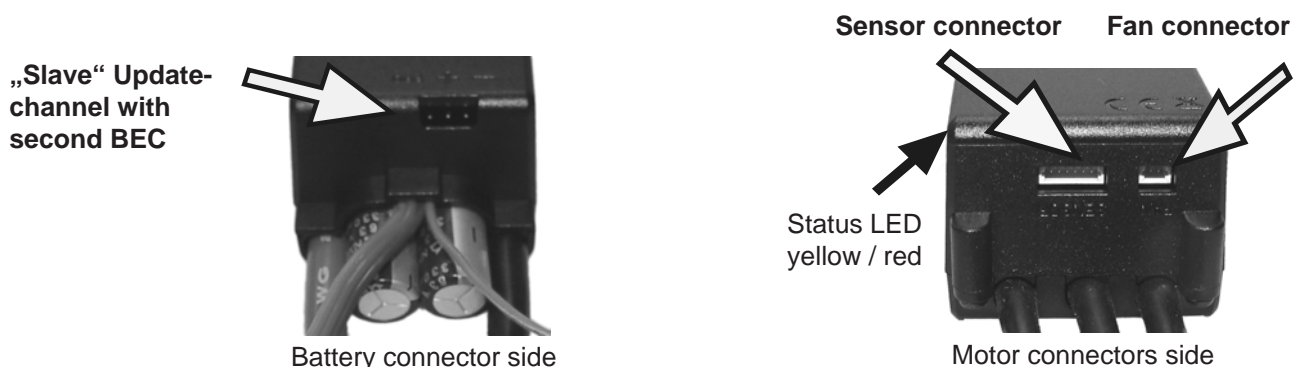
Connecting the speed controller BRUSHLESS CONTROL HV+T 60 - 160, Opto

The speed controller feature an optocoupler to the signal input side (gas passage). That means the connected receiver requires a separate power supply because no BEC is present in the system, ie the controller supplies no voltage to the receiver. (see illustration)



When selecting the receiver battery, note that you need to have adequate battery capacity for all servos to provide sufficient power. Pay attention also to a corresponding cross -section of the battery connection cable so under high load the voltage can not collapse. Especially when using a large number of servos it is recommended to connect the power supply to the receiver via two entrances. Here you have the two outer ports, which are marked on the receiver with a ‚B‘. If you connect a separate battery pack to each battery terminal, make absolutely sure that the batteries have the same rated voltage and capacity. Do not connect different types of batteries or batteries with highly different charging states, because this may lead to short-circuit-like effects. Use in such cases, for safety reasons, voltage stabilizers like the PRX-5A-receiver power supplies (No. 4136) between the battery and receiver.

Side connections of the BRUSHLESS CONTROL+T 60-160, HV



English

Installing in the model, first use

Mount the speed controller in the model so that it is isolated from vibration and shock and make sure the heatsink is free for best cooling. Make sure that there is sufficient cooling of the motor and speed controller by directing adequate cooling air from the outside airflow.

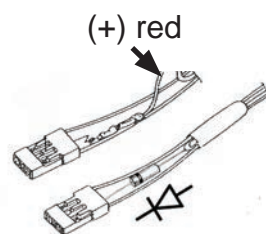
- Turn the transmitter on and check the servo travel of the throttle channel which should be $\pm 100\%$ or, with Multiplex R/C systems, $\pm 80\%$. Robbe/Futaba systems need reversing (REVERSE) the throttle arm travel! With Graupner/JR/SJ systems, the latter should be set to "NORMAL".

⚠ WARNING: the BEC voltage of the speed controller is adjustable from 5 to 8 V. The factory setting is 5.6 V and works for all receiver and servos. A voltage above 5.6 V may only be programmed when the receiver and all connected servos are suitable for this voltage, eg. high-voltage servos! **Risk of fire!**

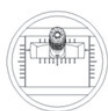
Capacitor for BEC (included)

Use the supplied capacitor to stabilize the BEC voltage by plugging it into an available channel of the receiver. The capacitor bridges short voltage dips at peak times.

⚠ Warning: If you do not want to use the BEC supply from the controller and instead use a separate battery, you have to remove and isolate the red wire (+) of the BEC plug as shown in the sketch. This will prevent a backflow into the controller, which could destroy the controller. If you want to connect a battery to the BEC system, a diode (e.g. Schottky diode 91505) needs to be soldered into the BECs red wire, so that the current can only flow from the BEC to the receiver.



Calibrating the transmitter travels for full-throttle and motor off

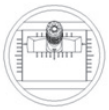


1. Switch the transmitter on ("ON"), then move the throttle stick to the "full-throttle" position and hold it there.
2. Connect the dry / rechargeable battery to the speed controller with correct polarity. When all the leads are correctly inserted, the motor emits a brief beep to confirm that the power supply is connected.

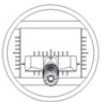


3. After about ten seconds you hear a brief melody (di-da-di), and both LEDs (red and yellow) flash to indicate that the speed controller has detected the full-throttle position.
4. Move the throttle stick to the motor OFF position (back towards you) within four seconds: the motor emits a brief beep (di-da), and both LEDs flash. Hold the throttle stick in that position until you hear a brief melody - only the yellow LED lights up - to indicate that the speed controller has detected and stored the motor OFF position.
5. Full-throttle and motor OFF are now programmed; disconnect the power supply from the speed controller in order to store the settings.

Calibrating the transmitter travels for full-throttle - neutral - brake (or reverse)



1. Switch the transmitter on ("ON"), then move the throttle stick to the "full-throttle" position and hold it there.
2. Connect the dry / rechargeable battery to the speed controller with correct polarity. When all the leads are correctly inserted, the motor emits a brief beep to indicate that the power supply is connected.
3. After about ten seconds you hear a brief melody (di-da-di), and both LEDs (red and yellow) flash to indicate that the speed controller has detected the full-throttle position.
4. Move the throttle stick to the neutral position (e.g. centre) within four seconds. The motor emits a brief beep (di-da), and the yellow LED flashes to indicate that the speed controller has detected the neutral position.
5. Move the throttle stick to the bottom position (back towards you) within six seconds. The motor emits a brief beep (di-da), and both LEDs flash. Hold the throttle stick in that position until you hear a brief melody - only the yellow LED lights up - to indicate that the speed controller has detected the motor OFF position.
6. Full-throttle - neutral - brake - reverse are now programmed; disconnect the power supply from the speed controller in order to store the settings.



Note: the 'reverse' function is only available in 'Boat' and 'Car' mode, and must be activated separately at the transmitter when calibration is complete. For more information please refer to the section entitled 'Settings'.

LED status during operation

Function	yellow LED	red LED	Nr.	LED	Error
Neutral	on	off	1	Yellow LED flashes 1 x	Throttle stick not at neutral or reverse position, check programming if necessary
Full throttle	off	on	2	Red LED flashes 1 x	no signal
Full brake	on	on	3	Red LED flashes 2 x	Battery voltage too low
Reverse	off	off	4	Red LED flashes 3 x	Temperature of speed controller too high
			5	Red LED flashes 4 x	Current too high
			6	Red LED flashes 5 x	Sensor error of sensed motor
			7	Red LED flashes 6 x	- Check motor, it is a motor problem when use sensed motor. - If error shows when power is getting on, please send the product to our service department.
			8	Yellow and red LED flashes 1 x	- Searching model*

*** Error message 8 - model search:**
When the throttle stick is below the programmed end position or braking position, the controller will beep after 30 seconds the engine and blink the two LEDs on the controller. This serves to find a crashed and lost model better. Enable this function by setting M.Lost_beep-Funktion „on“ in the „User setup“ menu on page 5. The volume of the tone is adjusted by „Beep level“.

The error messages are retained until the speed controller is disconnected from the battery. The exception is message No. 2, which disappears as soon as the speed controller picks up a valid signal again.

Settings - Programming

The BRUSHLESS CONTROL +T series of speed controllers can be programmed either directly using the transmitter, or via the telemetry settings if you are using a Graupner/SJ HoTT RC system.

Settings in programming mode (without HoTT radio control system)

Start by programming the speed controller as described under “Calibrating the transmitter travels”, working through as far as Point 4 or 5.

Move the stick to the full-throttle position again, and hold it there for at least six seconds: the speed controller now beeps five times to indicate that it is in programming mode.

The mode (1 - 5) is indicated by the yellow LED, the parameters by the red LED. The LEDs flash to indicate the settings, e.g. 2 x flashes of the yellow LED equates to mode 2 (direction of rotation), 1 x flash of the red LED equates to normal (direction of rotation).

To set the mode, move the throttle stick to the Stop / Reverse position (throttle stick right back), then return it to the “full-throttle” position to switch to the next mode. The switch is confirmed by 2 x beeps.

When you are in the desired mode, move the throttle stick to the Stop / Reverse position for two seconds: you can now program the parameters.

The red and yellow LEDs flash simultaneously, according to the set parameter.

You can now program the parameter by alternating between “full-throttle” and Stop / Reverse; advancing the throttle increases the value by one.

When you reach the desired value, store the setting by holding the throttle stick at the full-throttle position for at least two seconds. The speed controller beeps 3 x as an audible confirmation.

Repeat the procedure for all the remaining parameters which you wish to program, starting in each case at Point 3.

When everything is programmed to your satisfaction, store the settings by disconnecting the power supply from the speed controller.

Note: the settings in mode 3 vary according to the model type (mode 4). It is therefore essential to program the model type first!

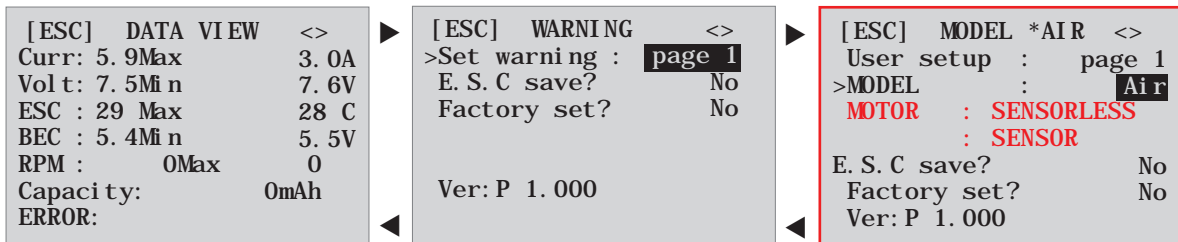
Yellow LED	Mode	Red LED											
		1	2	3	4	5	6	7	8	9	10	11	
1	Battery type	LiPo	NiMH										
2	Rotation	normal	reverse										
3	Auto brake (fixed wing models) in%	0	10	20	30	40	50	60	70	80	90	100	
	Governor (helicopter)	off	on										
	Reverse function (boat/car)	oneway	twoway										
4*	Motortype	Sensorless	Sensor										
5	Model type	plane	heli	boat	car								
6	factory reset	no	yes										

*For controllers without sensor connection mode Void 4, 5 becomes 4, and 6 to 5.

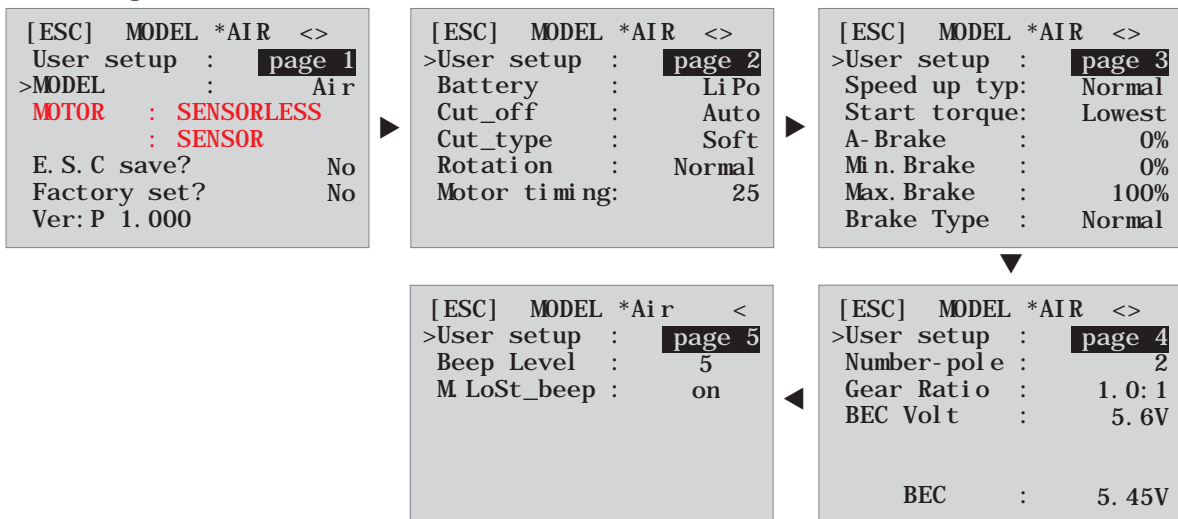
Settings in programming mode (with HoTT radio control system)

The method of operating the HoTT transmitter. For more information please read the section entitled "Telemetry" in the operating instructions supplied with your radio control system. Programming is carried out in the transmitter's "Telemetry" menu under the menu point "SETUP / DISPLAYS". The sensor displays come next in sequence after the transmitter - receiver displays, i.e. the "ESC DATA VIEW" display follows the last display of the RC system's servo test (RX SERVO TEST). **Please note the following:** the menus can only be selected if the receiver is switched on! When you switch the receiver on, it may take a few seconds for the display to become active - i.e. before you can select it. There might be a slight delay in the screen's response to inputs, as all settings are transferred directly to the receiver / speed controller by wireless means.

Attention! Menu item „Motor“ in page 1 is only visible if the controller has a sensor port for the engine!

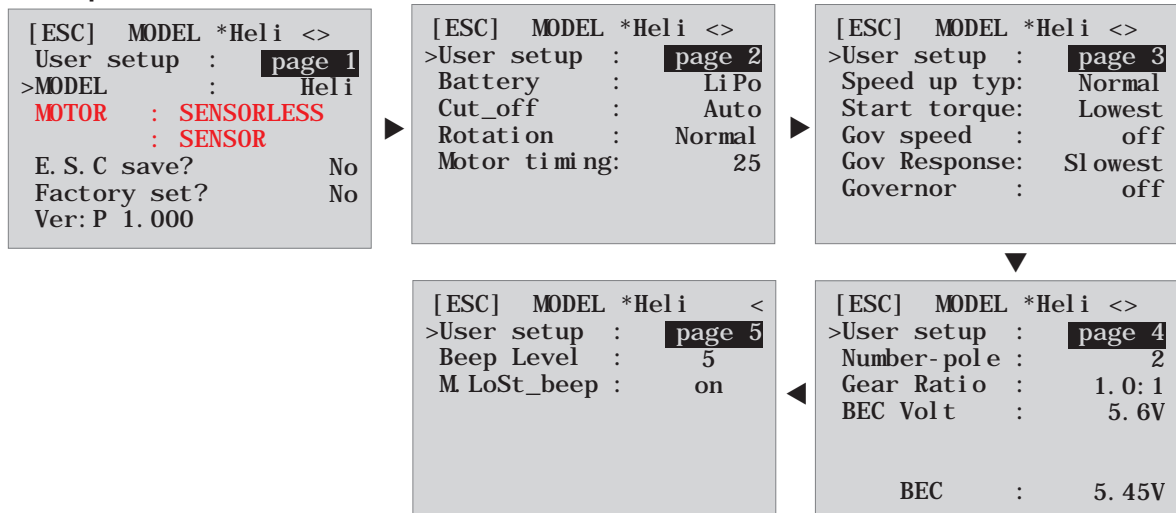


Fixed wing model:



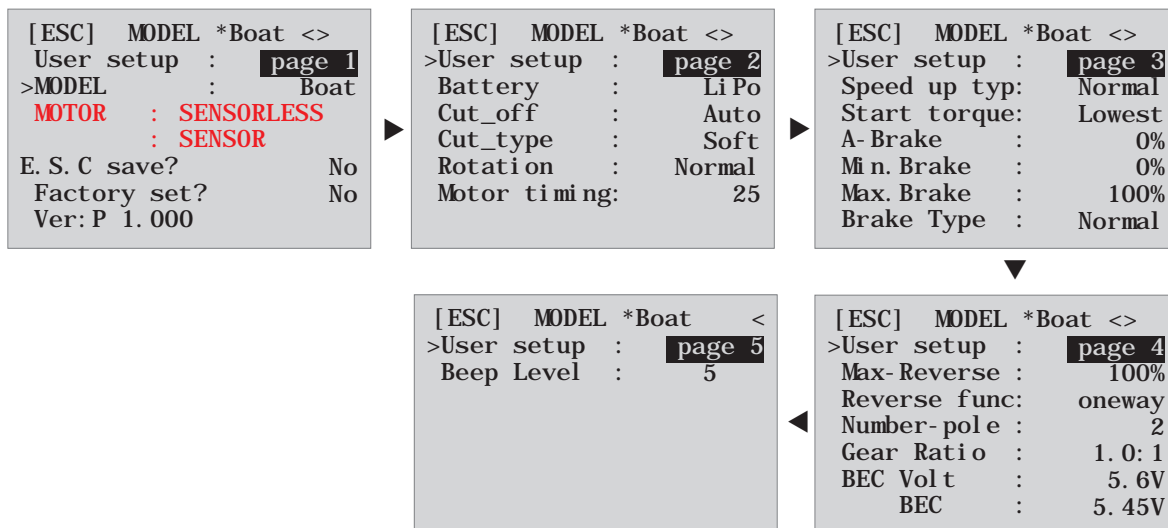
In Opto controllers menu the item „BEC Volt“ does not exist!

Helicopter:



In Opto controllers menu the item „BEC Volt“ does not exist!

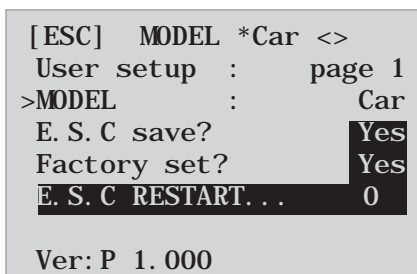
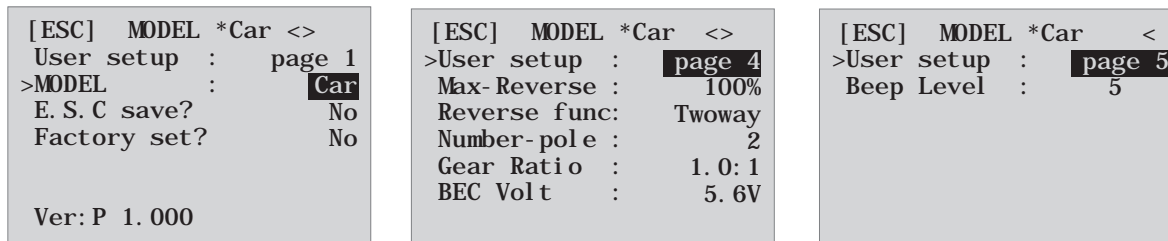
Boat:



Attention: In Opto controllers menu the item „BEC Volt“ does not exist!

Car:

These settings are similar to the “Boat” model type, with the exception of the reverse (two-way) function, which is activated by default.



To store the settings in the speed controller, use the INC (▲) or DEC (▼) button to return to the “page 1 - ESC MODEL” screen display, and select the “E.S.C. save” menu point. Simultaneously pressing the INC and DEC buttons (**SET**) highlights the parameter (black background). Press the INC button (▲) to move to YES, and then store the selected setting by simultaneously pressing the INC and DEC buttons (**SET**). An additional line “E.S.C. RESTART” now appears on the screen, and counts down starting at 3. The settings are permanently stored when the count reaches 0; “E.S.C. RESTART” disappears again to confirm this. If you do not wish to save the changes, select NO.

Note: the motor will not start if you alter settings but do not store them. This is an additional safety function to ensure that you do not overlook the 'saving' procedure.

The programmable parameters vary according to the selected model type:

Fixed wing models

Parameter	Display-Page	Description	Setup
User setup	Page 1	User setup: Model type, save settings	Air: Fixed wing model Heli: Helicopter Boat Car
Battery	Page 2	Battery type	LiPo, NiMH Factory setting: LiPo
Cut_off		Cutoff voltage (drive battery)	Auto, 6.0 - 32.0 V (HV/Opto 15 - 50V) Factory setting: auto
Cut_type		Cutoff type	soft, hard, Factory setting: soft
Rotation		Direction of rotating	normal, reverse, Factory setting: normal
Motor timing		Motor timing	0 - 25°, Factory setting: 25° (HV/Opto 25°)
Speed up type	Page 3	Acceleration	lowest, low, normal, high, highest, Factory setting: normal
Start torque		Start torque	lowest, low, normal, high, highest, Factory setting: lowest
A-Brake		Automatic brake	0 - 100 %, Factory setting: 0%
Min-Brake		Minimum brake	0 - 50 %, Factory setting: 0%
Max-Brake		Maximum brake	50 - 100 %, Factory setting: 100%
Brake Type		Brake response	softest, soft, normal, hard, Factory setting: normal
Number pole	Page 4	Number of motor poles (important for the correct speed display)	2 - 36, Factory setting: 2
Gear ratio		Gear ratio (important for the correct RPM display)	1.0:1 - 25.0:1, Factory setting: 1.0:1
BEC Volt not in opto version!		BEC voltage	5.0 - 8.0 V, Factory setting: 5.6 V Adjustment not possible with Opto controllers!
Beep Level	Page 5	Tone volume	1-5/off
M.LoSt_beep		Tone to find the lost model	on/off

Helicopter

Parameter	Display-page	Description	Setup
User setup	Page 1	User setup: Model type, save settings	Air: Fixed wing model Heli: Helicopter Boat Car
Battery	Page 2	Battery type	LiPo, NiMH Factory setting: LiPo
Cut_off		Cutoff voltage (drive battery)	Auto, 6.0 - 32.0 V (HV/Opto 15 - 50V) Factory setting: auto
Rotation		Direction of rotating	normal, reverse, Factory setting: normal
Motor timing		Motor timing	0 - 25°, Factory setting: 25° (HV/Opto 25°)
Speed up type	Page 3	Acceleration	lowest, low, normal, high, highest, Factory setting: normal
Start torque		Start torque	lowest, low, normal, high, highest, Factory setting: lowest
Gov speed		Governor speed (see below)	on/off, Factory setting: off
Gov response		Governor response	slowest (8 ms), slow (6 ms), normal (4 ms), fast (2 ms), fastest (1 ms), Factory setting: fastest
Governor		Governor mode	on/off, Factory setting: off
Number pole	Page 4	Number of motor poles (important for the correct speed display)	2 - 36, Factory setting: 2
Gear ratio		Gear ratio (important for the correct RPM display)	1.0:1 - 25.0:1, Factory setting: 1.0:1
BEC Volt not in opto version!		BEC voltage	5.0 - 8.0 V, Factory setting: 5.6 V Adjustment not possible with Opto controllers!
Beep level	Page 5	Tone volume	1-5/off
M.LoSt_beep		Tone to find the lost model	on/off

Gov speed: Governor Speed is a further development of the familiar Governor mode. In this case the motor speed is stored according to the throttle stick position - but regardless of the battery in use (cell-count, quality). This means that the controller regulates rotational speed according to the load on the motor, regardless of the state of the battery, i.e. whether it is fully charged or almost flat, or whether - for example - you are using a 4S or 5S battery.

- Governor mode must first be activated (Governor ON).
- Switch Governor Speed on (ON) - don't forget to store the setting on page 1, otherwise the motor will not run.
- Advance the throttle until the desired rotational speed is reached. We recommend a value of 70 - 80%, to ensure that there is a reserve available for the regulatory process. If the motor runs stably at this speed, the yellow LED on the speed controller flashes briefly to indicate that the rotational speed is now stored.
- To store the value permanently in the speed controller leave the throttle stick at the motor OFF position for at least three seconds.

Note:

- If you intend to use different batteries, it is important to test-fly the Governor Speed using the “smallest” battery; i.e. if you plan to use 4S and 5S batteries, the setting must be established using the 4S battery.
- Gaslimitter must be fully open! Before programming, please perform a factory reset!
- Initial start-up and saving process of the speed must not be interrupted, otherwise incorrect speed is stored. In this case a factory reset must be carried out again.

Boats

Parameter	Display-page	Description	Setup
User setup	Page 1	User setup: Model type, save settings	Air: Fixed wing model Heli: Helicopter Boat Car
Battery	Page 2	Battery type	LiPo, NiMH Factory setting: LiPo
Cut_off		Cutoff voltage (drive battery)	Auto, 6.0 - 32.0 V (HV/Opto 15 - 50V) Factory setting: auto
Cut_type		Cutoff type	soft, hard, Factory setting: soft
Rotation		Direction of rotating	normal, reverse, Factory setting: normal
Motor timing		Motor timing	0 - 25°, Factory setting: 25° (HV/Opto 25°)
Speed up type	Page 3	Acceleration	lowest, low, normal, high, highest, Factory setting: normal
Start torque		Start torque	lowest, low, normal, high, highest, Factory setting: lowest
A-Brake		Automatic brake	0 - 100 %, Factory setting: 0%
Min-Brake		Minimum brake	0 - 50 %, Factory setting: 0%
Max-Brake		Maximum brake	50 - 100 %, Factory setting: 100%
Brake Type		Brake response	softest, soft, normal, hard, Factory setting: normal
Max-Reverse	Page 4	Maximum reverse	20 - 100 %, Factory setting: 100%
Reverse func.		Reverse function	oneway, twoway, Factory setting: oneway
Number pole		Number of motor poles (important for the correct speed display)	2 - 36, Factory setting: 2
Gear ratio		Gear ratio (important for the correct RPM display)	1.0:1 - 25.0:1, Factory setting: 1.0:1
BEC Volt not in opto version!		BEC voltage	5.0 - 8.0 V, Factory setting: 5.6 V Adjustment not possible with Opto controllers!
Beep level	Page 5	Tone volume	1-5/off

Car models

Parameter	Display-Page	Description	Setup
User setup	Page 1	User setup: Model type, save settings	Air: Fixed wing models Heli: Helikopter Boat Car
Battery	Page 2	Battery type	LiPo, NiMH Factory setting: LiPo
Cut_off		Cutoff voltage (drive battery)	Auto, 6.0 - 32.0 V (HV/Opto 15 - 50V) Factory setting: auto
Cut_type		Cutoff type	soft, hard, Factory setting: soft
Rotation		Direction of rotation	normal, reverse, Factory setting: normal
Motor timing		Motor timing	0 - 25°, Factory setting: 25° (HV/Opto 25°)
Speed up type	Page 3	Acceleration	lowest, low, normal, high, highest, Factory setting: normal
Start torque		Start torque	lowest, low, normal, high, highest, Factory setting: lowest
A-Brake		Automatic brake	0 - 100 %, Factory setting: 0%
Min-Brake		Minimum brake	0 - 50 %, Factory setting: 0%
Max-Brake		Maximum brake	50 - 100 %, Factory setting: 100%
Brake Type		Brake response	softest, soft, normal, hard, Factory setting: normal
Max-Reverse	Page 4	Maximum reverse	20 - 100 %, Factory setting: 100%
Reverse func.		Reverse function	oneway, twoway, Factory setting: twoway
Number pole		Number of motor poles (important for the correct speed display)	2 - 36, Factory setting: 2
Gear ratio		Gear ratio (important for the correct RPM display)	1.0:1 - 25.0:1, Factory setting: 1.0:1
BEC Volt not in opto version!		BEC voltage	5.0 - 8.0 V, Factory setting: 5.6 V Adjustment not possible with Opto controllers!
Beep level	Page 5	Tone volume	1-5/off

Setting the motor brake on surface, boat and vehicle models

A-Brake (Auto Brake)

In this setting, the braking effect is controlled automatically from 1 to the set value (max. 100 %), when reaching the braking point on the throttle stick. 0 % means Auto Brake off.

Min and Max Brake settings have no effect.

Brake type settings are effective.

The activation of A-Brake is possible with both teach-in versions for the transmitter travel (see page 13).

Min-Brake, Max-Brake (minimum braking effect, maximum braking effect)

In this setting, the initial and final braking effect when reaching the braking point on the throttle stick is set (see graphic below)

Only effective if Auto Brake on 0 % and full throttle-neutral-brake teach-in version for the transmitter travel (see page 13) has been selected.

Brake type (brake response)

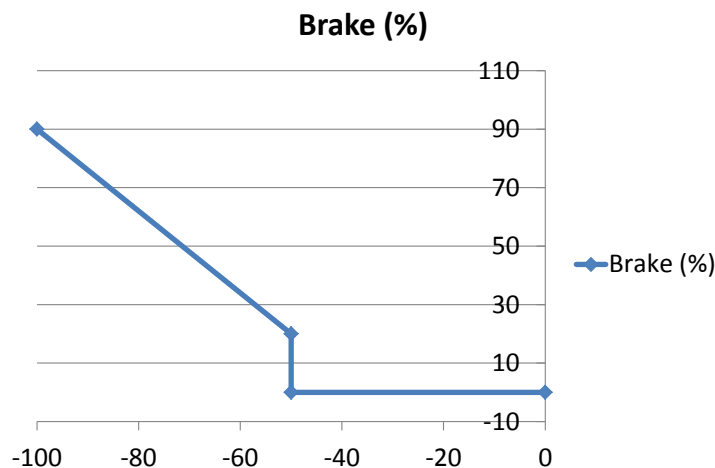
In this setting, the brake response is set.

Setting options in 4 increments: softest, soft, normal, hard.

This means:

softest = braking effect takes effect very slowly; hard = braking effect takes effect quickly (suddenly).

Braking effect Graupner T series ESC (air mode)



Example Min.Brake=20, Max.Brake=90, A-Brake and Brake type not relevant.

ESC Data View

```
[ESC] DATA VIEW <>
Curr: 5.9Max      3.0A
Volt: 7.5Min      7.6V
ESC : 29 Max      28 C
BEC : 5.4Min      5.5V
RPM : 0Max        0
Capacity: 00000 mAh
ERROR:
```

The ESC DATA VIEW display shows the telemetry data of the BRUSH-LESS CONTROL +T. This is not a “live display”, and is suppressed when the model is actually operating. Use the graphic screen for this - see „GRAPHIC DISPLAY OF TELEMETRY DATA“

Parameter	Description	Setup
Curr(ent)	The actual current drain of the connected motor, maximum current drain since switching on (Max)	-
Volt	Current voltage of the connected battery, minimum voltage since the start (Min)	-
ESC	Current temperature of the ESC in °C, maximum temperature since the start (Max)	-
BEC	Current BEC voltage, minimum voltage since the start (Min)	-
RPM (MAX)	Maximum RPM of the connected motor since the start	-
RPM (Avg)	Average RPM of the connected motor since the start	-
Capacity	Used capacity of the connected battery since the start	-
Error	OC: Overcurrent, T: Overheat, V: Low-Tension, R: No receiver signal	-

Setup structure - Programming warning thresholds

```
[ESC] DATA VIEW <>
Curr: 5.9Max      3.0A
Volt: 7.5Min      7.6V
ESC : 29 Max      28 C
BEC : 5.4Min      5.5V
RPM : 0Max        0
Capacity: 00000 mAh
ERROR:
```

▶

```
[ESC] WARNING <>
>Set warning : page 1
E. S. C save? No
Factory set? No

Ver: P 1.000
```

◀

```
[ESC] VOLTAGE <>
>Set warning : page 2
Voltage : 6.0V
Warni ng Ti me: off
Repeat Ti me : ALWAYS
Si gnal Tone : P

Mi n- Vol t : 7.5V
```

Note:

▲ and ▼ describes the UP and DOWN buttons at the transmitter, INC and DEC describes the UP and DOWN buttons at the SMART-BOX, **SET** describes the ENTER button

If you wish to carry out an adjustment, you must use the INC or DEC buttons (▲ or ▼) above the screen to select the desired parameter (e.g. page 2) by moving the arrow cursor (INC or ▲ moves the cursor down, DEC oder ▼ moves it up). Simultaneously pressing the INC and DEC (**SET**) buttons switches the parameter

to be adjusted to inverse video (white on black); this indicates that it can be programmed: pressing the INC (▲) button at this point increases the value, pressing the DEC (▼) button reduces the value. When the adjustment is complete, save the selected setting by pressing the INC and DEC (**SET**) buttons simultaneously; the dark background now disappears in order to confirm this action.

Display (Set Warning): shows the various „display pages“ with the possible adjustable parameters and the associated adjustable warning thresholds (page 1, page 2, etc.). To switch between pages, press the INC or DEC key (▲ or ▼).

Parameter	Display-Page	Description	Setup
Set Warning	Page 1 – page 6	Parameter Display	Page 1 – page 6
Voltage	Page 2	Minimum voltage in Volt	6.0 - 32.0V (HV/Opto 15 - 50V)
Temperature	Page 3	Maximum ESC temperature in °C	10 to 120° C
Max. Current	Page 4	Maximum current of the connected motor in A	25 to xxx A
Motor Temp (only with sensor)	Page 4	Maximum motor temperature in °C	10 - 120°C
Minimum RPM	Page 5	Minimum RPM of the connected motor in RPM	10 to 100.000 RPM
Capacity	Page 6	Maximum capacity	100 - 60000 mAh
Warning Time	Page 2 – page 6	Warning time	OFF, 5, 10, 15, 20, 25, 30 sec.
Repeat Time	Page 2 – page 6	Repeat time	always, 1, 2, 3, 4, 5 minutes, one time
Signal Tone	Page 2 – page 6	Sinal tone (voice output)	
E.S.C save	Page 1	Saves the settings in the speed controller	YES / NO
Factory Set	Page 1	Reset to factory setting	YES / NO

The following parameters can be set separately for all displays:

Warning Time: sets whether and how long the warning signal is activated when reaching a certain value for each display screen - OFF deactivates the warning.

Repeat Time: sets how often the warning signal is activated when reaching a certain value for each display screen.

Signal Tone: sets the signal tone melody. The warning sounds are combined with the warnings on the display and the voice output. Therefore, they may not be changed.

When a warning is activated, the corresponding message (e.g. VOLTAGE) is shown inverted in the first row of the associated display and the signal tone respectively voice output sounds.

If you wish to carry out an adjustment (page 2 to 6) you must use the INC (▲) or DEC (▼) buttons above the screen to select „page 1 - ESC WARNING“ and choose „E.S.C save“. Simultaneously pressing the INC and DEC buttons (**SET**) switches the parameter to be adjusted to inverse video (white on black); this indicates that it can be programmed: pressing the INC (▲) button at this point increases the value to YES. When the adjustment is complete, save the selected setting by pressing the INC and DEC buttons (**SET**) simultaneously; the dark background now disappears in order to confirm this action. If you do not want to save the adjustments, select NO.

⚠ WARNING: Do not carry out any programming work on the sensors while the model is flying, otherwise there is a real risk that your model will fly out of control while you are not concentrating on it!

If your model is fitted with two or more receivers, it is absolutely essential that you do not carry out programming work during a flight, as this can alter the settings in the receivers to which no telemetry equipment is connected; in the worst case this could result in the model crashing.

For this reason always carry out programming on the ground, and check that only the receiver with connected sensors is powered on.

Minimum Voltage (Page 2)

```
[ESC] VOLTAGE <>
>Set warning : page 2
Voltage : 6.0V
Warning Time: off
Repeat Time : ALWAYS
Signal Tone : P

Min-Volt : 7.5V
```

Minimum Voltage: Warning threshold for the minimum battery voltage, set between 6.0 and 32 V (HV/Opto: 15.0 and 50.0V)
 Factory setting: 6.0 V (HV/Opto 18.0V), Signal Tone: P
 Warning OFF

Maximum temperature (Page 3)

```
[ESC] TEMPERATURE <>
>Set warning : page 3
Temperature : 60 C
Warning Time: 5sec
Repeat Time : ALWAYS
Signal Tone : H

ESC. Temp : 29 C
```

Maximum ESC Temperature: Warning threshold for the maximum ESC temperature, set between 10 and 120°C.
 Factory setting: 60°C, Signal tone: H
 Warning 5 sec

Maximum motor temperature (Page 4)

```
[ESC] MOTOR TEMP. <>
>Set warning : page 4
Temperature : 100 C
Warning Time: 5sec
Repeat Time : ALWAYS
Signal Tone : I

MOTOR Temp : 29 C
```

Maximum MOTOR Temperature: Warning threshold for the maximum MOTOR temperature, set between 10 and 120°C.
 Factory setting: 100°C, Signal tone: I
 Warning 5 sec

Maximum current (Page 5)

```
[ESC] MAX. CURRENT<>
>Set warning : page 5
Maximum cur : 100A
Warning Time: 5sec
Repeat Time : ALWAYS
Signal Tone : W

MAX. CURR : 5.3A
```

Maximum Current: Warning threshold for the maximum current of the drive motor, set between 25 and XXX A.
Note: the warning threshold should never be set to a higher value than the maximum permissible current for your speed controller type, as this would prevent sensible warnings being generated!
 Factory setting: depending on speed controller, Signal tone: W
 Warning 5 sec

Minimum RPM (Page 6)

```
[ESC] MINIMUM RPM <>
>Set warning : page 6
Minimum RPM : 100
Warning Time: off
Repeat Time : ALWAYS
Signal Tone : T

RPM : 0
```

Minimum RPM: Warning threshold for the minimum RPM, set between 10 and 100.000 RPM.
 Factory setting: 100 RPM, Signal tone: T
 Warning OFF

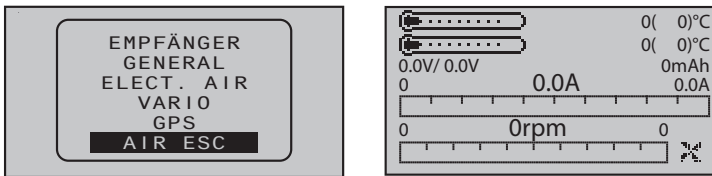
Capacity (Page 7)

```
[ESC] CAPACITY <>
>Set warning : page 7
Capa. warni ng: 02000
Warni ng Ti me: off
Repeat Ti me : ALWAYS
Signal Tone : V
CAPACITY : 00000 mAh
```

CAPACITY: Warning threshold for the maximum capacity, set between 100 and 60000 mAh.
 Factory setting: 2000 mAh, Signal tone: V
 Warning OFF

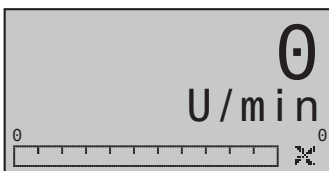
Graphic display of telemetry data

For information on displaying telemetry data please read the instructions supplied with your radio control system or SMART-BOX.



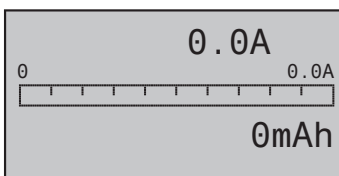
This screen displays the data generated by a BRUSHLESS CONTROL +T. Key, reading from top right:

Value	Explanation
V	Left-hand value: actual battery voltage Right-hand value: actual battery voltage in present power-on period
°C	Left-hand value: actual speed controller temperature Value in brackets: maximum controller temperature in present power-on period
mAh	Battery capacity consumed
A	Centre and bar display: actual current Right-hand value: maximum current in present power-on period
rpm	Centre and bar display: actual rotation speed of the motor connected to the ESC Right-hand value: maximum rotational speed in present power-on period



RPM display

This screen displays the current rotational speed of the motor connected to the brushless speed controller.

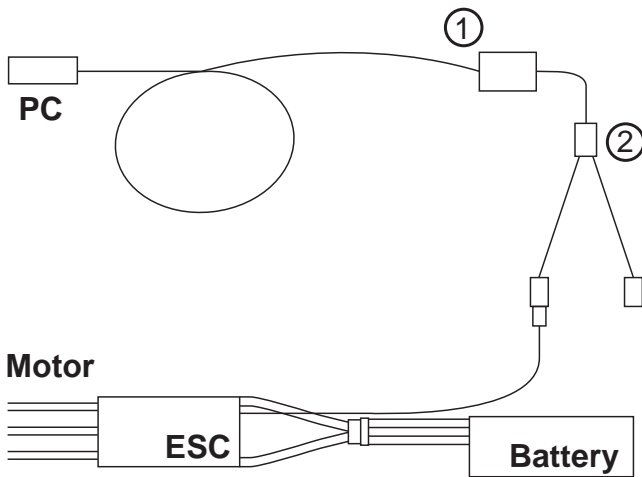


Current / consumption display

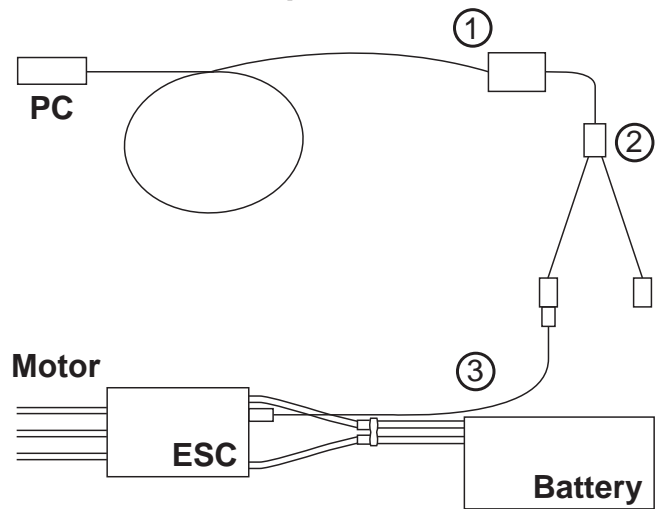
This screen displays the actual current consumption, the peak drain which has occurred in the present power-on period, and the capacity drawn from the battery connected to the brushless speed controller within the same period.

Firmware Update

Connection +T 18-100:



Connection HV, Opto +T 60-160:



CONNECTING THE SPEED CONTROLLER PRIOR TO UPDATING

Accessories required:

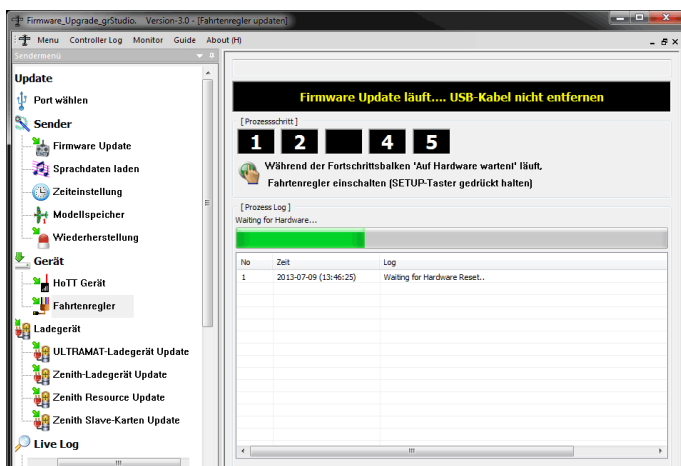
- (1) USB interface for Graupner/GM-GENIUS, 7166.6
- (2) Adapter cable, S8363
- (3) Connection cable, 33700.1

For both types of speed controller connect the adapter cable (2) to the USB interface (1). For the HV and Opto speed controllers the connection cable (3) has to be connected to the socket.

The power supply during the update must be provided through the connection of a battery.

UPDATING THE SPEED CONTROLLER

The user can exploit the update facility to maintain the BRUSHLESS CONTROL +T series speed controller constantly at the latest state of development, and to add expanded functions in future. The program required - "Firmware Upgrade gr_studio" - and the update files can be found in the Download area for the appropriate product at our website www.graupner.de, where they can be downloaded at no charge. There you will also find comprehensive instructions for connecting the BRUSHLESS CONTROL +T prior to updating, and the exact update procedure.



In the application call up the Speed controller point in the list on the left-hand side. A dialogue box now opens, offering the following choices: "Load automatically" and "Open file". If you wish to load the current firmware into the controller, select Load automatically. The application then attempts to download the current firmware via the Internet. Immediately after clicking on the button the bar starts to fill green from the left. Connect the speed controller power supply before the bar is completely filled: a further dialogue box now opens, in which you should click on the desired firmware, followed by the

"Open file" button. The application now downloads the file, and loads it into the speed controller. If you wish the controller to be loaded with special firmware to which you have access as a file, use "Open file". Select the appropriate file in the dialogue box which now opens: the bar starts to fill green. Connect the speed controller power supply before the bar is full, and the application then transfers the firmware.

Manufacturer's declaration on behalf of GRAUPNER/SJ GmbH

Contents of the manufacturer's declaration:

If material defects or manufacturing faults should arise in a product distributed by us in the Federal Republic of Germany and purchased by a consumer (§ 13 BGB), we, Graupner/SJ GmbH D-73230 Kirchheim/Teck, Germany, acknowledge the obligation to correct those defects within the limitations described below.

The consumer is not entitled to exploit this manufacturer's declaration if the failure in the usability of the product is due to natural wear, use under competition conditions, incompetent or improper use (including incorrect installation) or external influences.

This manufacturer's declaration does not affect the consumer's legal or contractual rights regarding defects arising from the purchase contract between the consumer and the vendor (dealer).

Extent of the guarantee

If a claim is made under guarantee, we undertake at our discretion to repair or replace the defective goods. We will not consider supplementary claims, especially for reimbursement of costs relating to the defect (e.g. installation / removal costs) and compensation for consequent damages unless they are allowed by statute. This does not affect claims based on legal regulations, especially according to product liability law.

Guarantee requirements

The purchaser is required to make the guarantee claim in writing, and must enclose original proof of purchase (e.g. invoice, receipt, delivery note) and this guarantee card. He must send the defective goods to us at his own cost, using the following address:

**Graupner/SJ GmbH, Service Department,
Henriettenstr.96, D 73230 Kirchheim/Teck, Germany
Service Department: tel. [0049] 7021-722130**

The purchaser should state the material defect or manufacturing fault, or the symptoms of the fault, in as accurate a manner as possible, so that we can check if our guarantee obligation is applicable. The goods are transported from the consumer to us and from us to the consumer at the risk of the consumer.

Duration of validity

This declaration only applies to claims made to us during the claim period as stated in this declaration. The claim period is 24 months from the date of purchase of the product by the consumer from a dealer in the Federal Republic of Germany (date of purchase). If a defect arises after the end of the claim period, or if the evidence or documents required according to this declaration in order to make the claim valid are not presented until after this period, then the consumer forfeits any rights or claims from this declaration.

Limitation by lapse of time

If we do not acknowledge the validity of a claim based on this declaration within the claim period, all claims based on this declaration are barred by the statute of limitations after six months from the time of implementation; however, this cannot occur before the end of the claim period.

Applicable law

This declaration, and the claims, rights and obligations arising from it, are based exclusively on the pertinent German Law, without the norms of international private law, and excluding UN retail law.

Declaration of conformity



EU-Konformitätserklärung EU-Declaration of Conformity

Hiermit bestätigen wir, dass das nachfolgend bezeichnete Gerät den angegebenen Richtlinien entspricht.
We herewith confirm that the following appliance complies with the mentioned directives.

Artikelbezeichnung: Brushless Control+T 18, 35, 45, 50, 60, 70, 80, 100, 120, 160
Article description:

Artikelnummer: 33718, 33735, 33745, S3046, 33760, S3031, S3040, 33770, S3041, S3042,
Article number: S3030, S3036, S3037, S3038, S3032, S3033, S3039, S3064

Firmenanschrift: Graupner|SJ GmbH
Company adress: Henriettenstrasse 96
D-73230 Kirchheim/Teck

Einschlägige EU-Richtlinien / Governing EU-directives / Directives CE concernées :

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> 1. Elektromagnetische Verträglichkeit (EMV)
Electromagnetic compatibility (EMC)
2004/108/EC | <input type="checkbox"/> 2. Niederspannungs-Richtlinie
Low-voltage directive
2006/95/EC |
| <input type="checkbox"/> 3. Maschinenrichtlinie
Mashine directive
2006/42/EC | <input type="checkbox"/> 4. Medizinprodukte (Klasse 1)
Medical device directive (Class 1)
93/42/EEC |
| <input type="checkbox"/> 5. Funkanlagen u. Telekommunikationseinrichtungen
Radio a. Telecommunication Terminal Equipment
R&TTE 1999/5/EC | <input type="checkbox"/> 6. Ökodesign-Richtlinie
Energy related products directive (ErP)
2009/125/EEC |
| <input type="checkbox"/> 7. Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten
Restriction of the use of certain hazardous substances
2011/65/EC | |

Harmonisierte EN-Normen / Harmonised EN-Standards

Der Artikel entspricht folgenden, zur Erlangung des CE-Zeichens erforderlichen Normen:
The article complies with the standards as mentioned below which are necessary to obtain the CE-symbol:

Zu 1:
EN 61000-6-1
EN 61000-6-3

Unterschrift / Signature

Position

Geschäftsführer / Managing Director

Ausstellungsdatum / Date of issue

25.08.2014

Notes

Garantie von
warrantied for
garantie de

24

Monaten
months
mois

Warranty

Die Fa.Graupner/SJ GmbH, Henriettenstrasse 96, 73230 Kirchheim/Teck gewährt ab dem Kaufdatum auf dieses Produkt eine Garantie von 24 Monaten. Die Garantie gilt nur für die bereits beim Kauf des Produktes vorhandenen Material- oder Funktionsmängel. Schäden, die auf Abnutzung, Überlastung, falsches Zubehör oder unsachgemäße Behandlung zurückzuführen sind, sind von der Garantie ausgeschlossen. Die gesetzlichen Rechte und Gewährleistungsansprüche des Verbrauchers werden durch diese Garantie nicht berührt. Bitte überprüfen Sie vor einer Reklamation oder Rücksendung das Produkt genau auf Mängel, da wir Ihnen bei Mängelfreiheit die entstandenen Unkosten in Rechnung stellen müssen.

Graupner/SJ GmbH, Henriettenstrasse 96, 73230 Kirchheim/Teck, Germany guarantees this product for a period of 24 months from date of purchase. The guarantee applies only to such material or operational defects which are present at the time of purchase of the product. Damage due to wear, overloading, incompetent handling or the use of incorrect accessories is not covered by the guarantee. The user's legal rights and claims under guarantee are not affected by this guarantee. Please check the product carefully for defects before you make a claim or send the item to us, since we are obliged to make a charge for our cost if the product is found to be free of faults.

La société Graupner/SJ GmbH, Henriettenstrasse 96, 73230 Kirchheim/Teck, Allemagne, accorde sur ce produit une garantie de 24 mois à partir de la date d'achat. La garantie prend effet uniquement sur les vices de fonctionnement et de matériel du produit acheté. Les dommages dus à l'usure, à la surcharge, à de mauvais accessoires ou à d'une application inadaptée, sont exclus de la garantie. Cette garantie ne remet pas en cause les droits et prétentions légaux du consommateur. Avant toute réclamation et tout retour du produit, veuillez s.v.p. contrôler et noter exactement les défauts ou vices.

Servicestellen / Service / Service après-vente

Graupner/SJ-Zentralservice
Graupner/SJ GmbH
Henriettenstrasse 96
D-73230 Kirchheim / Teck

Servicehotline
 (+49) (0)7021/722-130
Montag - Donnerstag
7:30 - 9:00 Uhr
9:15 - 16:00 Uhr
Freitag
9:00 - 13:00 Uhr

Graupner USA – OPENHOBBY LLC
3245 University Ave
Suite 1520
San Diego, CA 92104

Website: www.graupnerusa.com
Phone: +1 855-572-4746
Email: service@openhobby.com

Die Adressen der Servicestellen außerhalb Deutschlands entnehmen Sie bitte unserer Webseite www.graupner.de.

For addresses of service points outside of Germany please refer to www.graupner.de/en/.

Pour adresses des points de service situés en dehors de l'Allemagne s'il vous plaît se référer à www.graupner.de/fr/.

Garantie-Urkunde

Warranty certificate / Certifi cat de garantie
BRUSHLESS CONTROL +T

33718, 33735, 33745, 33760, 33770, S3030, S3031, S3032,
S3033, S3036, S3037, S3038, S3039, S3040, S3041, S3042

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