

# Hacker

## Brushless Motors



## **Manual**

### Master Basic Controller

OPTO and S-BEC-Typs  
for use with R/C airplane, helicopter and boat

Thank you for purchasing a Hacker Electronic Speed Controller. This product was developed in close co-operation with JETI and incorporates the latest technological developments.

We are proud to provide you with a very efficient Controller for brushless sensorless motors. Besides performance our mayor design goal was to assure reliable and safe operation and simple programming of the essential settings by transmitter use. In addition almost all parameters can be changed comfortably by using our JetiBox (programming box). In combination with this device you can adopt your HackerMasterSpin Electronic Speed Controller to your individual needs by the total programming possibilities our new Controller-Line offers.

Although the programming sequences of MasterSpin-Speedcontrollers are particularly logical and therefore easy to perform, using and operating requires some knowledge and a few basic skills. Please read the entire manual thoroughly before attempting to operate this electronic device. Especially important are our safety instructions which must be observed in any case.

We wish you joy and a lot of success with your new MasterBasic-Speed Controller.

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## 1. Safety and operating instructions

Building and operation of radio controlled models requires technical knowledge, careful handling, and safety awareness. Inaccurate assemblage as well as carelessness using can result in significant property and/or personal injuries. For these reasons build correctly, and care about the operating instructions, when mounting and operating a model with Speed Controllers.

The CE sign guarantees the observance of legal rules for undisturbed operation; however it does not entitle you to a careless Controller use. MasterSpin-Speed Controllers are developed exclusively for R/C model applications. Under any circumstances MasterSpin-Speedcontrollers may not be used in any man-carrying aircrafts or any other manned devices.

MasterSpin-Speedcontrollers are designed for exclusive operating with batteries. Never use Speed Controllers by connecting to a power supply. When the motor breaks an over voltage spike appears by energy return, which could destroy the power supply and Speed Controller. Never connect Speed Controllers or other propulsion components directly to the domestic 110/230 V / AC current.

In any case keep your body, any other persons, and objects away from the path of a propeller or other spinning motor parts, while a power battery is connected. Never lean over a running system. Make sure that no parts can come in touch with spinning drive parts; they could be thrown into your face, and could also weaken propeller and drive, causing mechanical or electric failures. Protect yourselves against any dangers coming from propellers and helicopter rotors. Keep anybody, especially small children, who can be hurt when the engine is running, at least 20 feet away. Mechanical or electrical damages can cause the motor to run unexpected and unintentionally. Make sure the motor is always properly mounted even for test runs. Check regularly that all screws of your drive are securely fastened.

Protect the Speed Controller against any vibrations, dust, wet, hits or pressures. Check Speed Controller regularly for damages. Should the electronic device have become wet, only reuse it again after doing a longer drying phase and an exact examination! Also the Speed Controller has to be completely checked after any model crash. Never use a damaged Speed Controller. If you want to use it farther, send the device immediately to Hacker repair service.

We defend any changes or modifications on the Speed Controller and his equipment. This is also considered for the battery connecting leads which have not to be extended. The battery wiring has to be as short as possible; they do not have to be longer than 15 cm (6 inch). For these reasons a current measurement has to be done only with a clamp-on ampmeter. Any measurement with an inserted ampmeter (resistance shunt) can cause destruction of the Speed Controller. The lengths of the engine power wires are not critical that much, but they also should be as short as possible. Long wires should be twisted to avoid electromagnetic interference of the R/C-receiver.

Use device only by outside temperatures between -10°C (14° F) up to +50°C (122° F). Provide sufficient cooling. Speed Controller operations are only permitted in no electrostatic surroundings, where no loading can come true.

Master Basic-Speed Controllers are not protected against polarity reversions; therefore you must be sure that polarity is correct when connecting the Speed Controller to the power battery. Connection with reversed polarity causes destruction of the device. We suggest using connectors which do not allow connection with reversed polarity mechanically. If you want to reverse the direction of motor rotation, never reverse battery connecting leads. To change the rotation of the motor, simply swap any two motor wires connections or do it by programming.

Never connect power battery wires directly to brushless engines. This will cause serious damages to the involved equipment. Any short circuits with power batteries may cause fire.

Except for emergency cases never separate the battery from the Speed Controller when the motor is running. This can cause high current peaks which can cause device destruction.

Some Speed Controller BEC types are equipped with a switch for the R/C-receiver power supply. **ATTENTION:** This switch does not disconnect, the power batteries, from the Speed Controller. A low residual current flows even if the switch position is OFF (AUS) which will cause a total discharge of the power batteries especially by Lion/LiPo-Cells applications! Therefore only connect the batteries to the Speed Controller immediately before operation and disconnect them directly after the end of the run.

When using a BEC device you can use a fully charged receiver battery with sufficient capacitance which is connected to a free receiver channel. Please charge the receiver battery with a separate charger. To know the permissible BEC load, which depends on how many cells are used as power battery and Speed Controller type, check on "BEC capacities list" below! Attention: Especially digital Micro servos may have a very high current drain, which means that the indicated number of Servos may, if necessary, need to be reduced. Check that the BEC provides enough power for your number and kind of servos on ground before maiden flight.

Before maiden flight and in regular intervals pre flight range tests of the radio control must be executed.

Mount your radio equipment, especially the receiver with his antenna, as far as possible away from Speed Controller, batteries and motor. Otherwise, high current magnetic fields could affect the receiving quality. Always perform a range test with low speed running motor, to make sure the perfect receiving function of your model.

For any connection you should use exclusively gold contact plugs and sockets which must be soldered perfectly to the wires. Never use strip connectors, crimp connectors or similar. For safety reasons always use identical products from the same manufacturer. This will minimize connection problems for example by battery changing. We recommend to use connectors, plugs and sockets from our accessories assortment.

Connect Speed Controller lead into the throttle channel on your receiver. Don't operate Speed Controller by a servo tester, because it could happen that motor will do some short starts due to some incorrect „throttle impulses“. For this we strongly recommend for any Speed Controller application an exclusive receiver use. We also recommend using only receivers from relevant manufactories!

Master Basic Speed Controllers are equipped with several extensive protection devices, which can only protect when operating in a „normal“ range. For example if you get a damaged motor winding or a wire short circuit or something similar, Speed Controller could be damaged or destroyed nevertheless. This is why you always have to control, on perfect functioning, all wires and connectors. Also a blocking of a relatively small motor, which is operated by a maladjusted oversized Speed Controller, does not necessarily cause the protection to switch off the current because the blocking current is a too small. Therefore always use motors with matched Speed Controllers.

**Warning!** High power motor systems can be very dangerous! High currents can heat wires and batteries, causing fires and burning skin. Follow the wiring directions carefully!  
Models equipped with high power motors can kill. Always fly at a sanctioned field. Never fly over or near spectators. Even though this Speed Controller is equipped with a safety arming program, you should still use caution when connecting the power battery.

## 2. Limitation of liability

In that Hacker Motor GmbH has no control over the correct use, installation, application, as well as the Speed Controller maintenance, no liability shall be assumed nor accepted or any damages, losses or costs resulting from the use of the product. Any claims arising from the operating, failure or malfunctioning etc. will be avoided. Hacker Motor GmbH assumes no liability for personal injury, property damage or consequential damages resulting from our delivery or our workmanship. As far as is legally admitted, with which legal arguments ever, the obligation to the compensation is limited to the invoice amount of the affected product. This does not apply, as far as we must avouch unrestrictedly after compelling laws or for rough negligence.

### 3. Product description

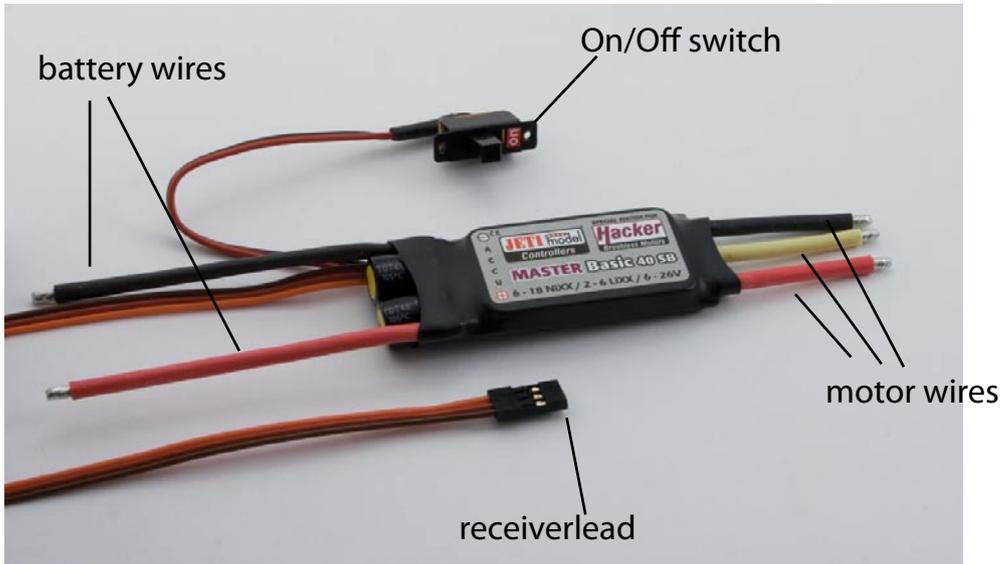
Master Basic-Speed Controllers are sophisticated electronic devices and especially recommended for Hacker-Brushless motor use. Various comfortable setting possibilities as well as different operating modes make these Speed Controllers also compatible to other brushless motors. Their compact dimensions make this Speed Controller also a good choice for small models.

In principle all Speed Controllers could be set up by transmitter as well as with our JetiBox. By using the JetiBox you will get the complete range of programming possibilities. Settings have to be programmed only once for every application. The Speed Controller stores the setup even if you disconnect the battery. Setup can be changed only by a new programming sequence. You get an overview of total programming possibilities on added sheets below.

Programming with by transmitter will reset all parameters to one of the modes you can choose by transmitter!

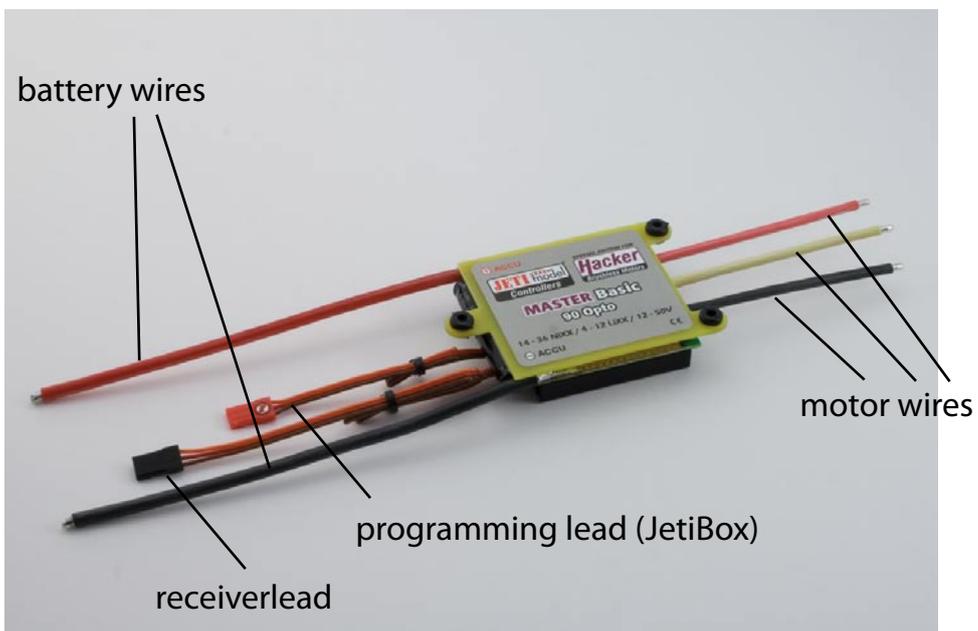
#### 4. Connections and controls

##### 4.1 MASTERSPIN-BEC - Typs



##### 4.2 MASTER-Basic-OPTO - Typ

The additional red UNI Plug (Rx) have to be used for programming the Master Basic opto with the JetiBox. Please switch off the Receiver before connecting this red plug with the JetiBox. Connect only the (Motor)Battery.



## 5. Initial Setup of MasterSpin-Speed Controllers

The initial operations, for all Speed Controllers' versions, are basically the same with very small differences. Basic conditions to start-up Speed Controller initial operations are that the motor is mounted correctly into the model and that Speed Controller has been connected properly.

Please observe also your motor's operating instructions. Connect the Speed Controller receiver lead to the receiver throttle channel properly. Please check anytime the total system to prevent malfunctioning, which can cause destruction of the Speed Controller.

Please make sure your transmitter ATV adjustments, for both side of the Speed Controller throttle stick or knob, are exactly 100%.

- When using Robbe/FUTABA transmitters, then your „throttle channel“ has to be reversed!
- Move throttle stick into motor stop position first then turn on transmitter.
- Connect the power battery; avoid any repeating battery plug in and out.
- Turn on receiver, when operating Speed Controllers with BEC-System then turn on its switch. The Controller MasterSpin 11 do not have a switch, due to weight reasons. The turning on is done by connecting the power battery.
- The motor will deliver a high tone signal (Beeping). After turning on, by activated brake, you will get only one „Beep“. You will get two “Beeps” if brake has not been activated.
- After approx. 5 seconds further „Beeps“ count up the timing mode (so-called timing monitor). Can be disabled with the JetiBox!
- Never move throttle stick/knob between turning on and the initial „Beep(s)“. If the „Beep“ sign does not sound, disconnect the power battery, then wait approx. 10 sec. and give it another try. After this, if „Beep“ does not come, check following points below:
  - o Is the Speed Controller receiver lead correctly connected to the receiver?
  - o Is the throttle stick/knob in motor „OFF“ position?
  - o Is the power battery fully loaded and connected correctly?
  - o Is receiver's power supply all right?

„Beeps“ only sound during the first turning on. If you turn off Speed Controller or receiver battery, without disconnecting the power battery, then there would be no signal (Beep) by switching on again.

- After „Beep“ sign the Speed Controller is armed and ready to operate. The „full power“ adjust is programmed automatically. If you didn't change (except Mode) the initial setup, then the Speed Controller will work with factory default setup:

Bremse / Brake	OFF
Betriebsmodus / Operation mode	normal
Vorzündung / Timing	auto
Schaltfrequenz / Frequency	8kHz
Beschleunigung / Acceleration	1sec (1,5sec für MasterBasic 90-Opto)
Akku-Typ / Accu Type	Li-Ion/Pol

Zellenzahl LiXX / Number of cells LiXX	auto
Unterspannung pro Zelle NiCd / Mh / Cut off per cell NiCd/Mh	0,7V
Unterspannung pro Zelle Li-Ion/Pol / Cut off per cell Li-Ion/Pol	3,2V
Unterspannung pro Zelle Li-Fe / Cut off per cell Li-Fe	2,5V
Abschaltart / Cut off	Zurückregelung / slow down
Drehrichtung / rotation	Links / left

## 6. Change settings of MASTER Basic-Speed Controllers by transmitter

### 6.1 Fundamental proceeding

The proceeding when programming our different Speed Controller versions is basically the same. Therefore we describe below once the programming sequence for all Speed Controller versions.

Make sure that for programming, the power battery (by non BEC Speed Controllers also the receiver battery) has sufficient capacitance and is fully charged. Also make sure, that your transmitter ATV adjustments of the Speed Controller throttle stick are 100% for both sides. With Multiplex transmitters use its „UNI“ setting for the impulse system. If using Robbe/FUTABA transmitters, you have to reverse the throttle channel!

Move the throttle stick to „full power“ position first and then turn on the transmitter. Now, when switching on the Speed Controller, the programming sequence will start. This will be indicated acoustically by a four-tone melody (in contrast to a single or double „Beep“ in normal operation).

Besides, the software guarantees, that motor does not start, even if the throttle stick is in full power position. Each programmed setting will be signed by a melody. For all settings the Speed Controller will count the different modes by a sequence of acoustic signals with a rising number of „Beeps“. When the desired mode is indicated by the corresponding number of „Beeps“, move the throttle stick to „motor Stop“ position. The Speed Controller signs the new mode setting by an associated sound signal and stores the setup.

Please notice that only one mode can be changed at once. For any further changes the power battery has to be disconnected and the programming sequence must be started again.

This programming is repeatable any time you want.

## 6.2 Settings by transmitter

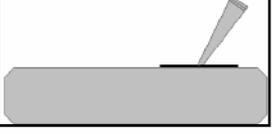
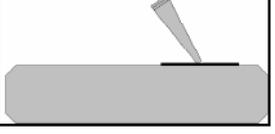
1x Beep	- Brake On/Off default setting was brake off, with the first programming step you will set brake on, next steps off, on, off...
2x Beep	- Battery-Typ NiCd/Mh Cutt Off voltage 0,7V/per cell slow down
3x Beep	- Battery-Typ Lilo/Po Cutoff voltage 3,2V/per cell slow down
4x Beep	- Battery-Typ LiFe CuttOff voltage 2,5V/per cell slowdown
5x Beep	- change mode from „Normal (Plane)“ to „Heli-Mode“ Acceleration in Normal mode: 1 sec. Acceleration in Helimode: 10 sec. no Brake „Heli-Mode“ deaktiviert

Please Note!

LiPo-Autodetect only works correct if LiPo-Pack is fully charged when conected!

### 6.3 Settings by transmitter

Please follow strictly this steps below:

Turn on the transmitter	TX On
Move throttle stick on „full power“ position. Now when switching on the Speed Controller, programming sequence will start, motor will not run.	
Connect the power battery; avoid any repeating battery plug in and out.	connect bat-
Switch on the receiver, when operating Speed Controllers with BEC-System, turn on the BEC with its switch.	RX On
Controller does, after approx. 5 sec., a four-tone melody, which signs that programming sequence is initiated.	
After again waiting 5 sec., the different modes would be indicated by melodies. You will get five times one to 5 „Beeps“. Consider the following system: - Mode 1: five times one „Beep“ in a row - Mode 2: five times two „Beeps“ in a row - and so on..... - Mod5 5: five times 5 „Beeps“ in a row	 to 
<b>While</b> the wished mode is indicated by the according number of „Beeps“, move the throttle stick into „motor stop“ position.	
The Speed Controller changes the mode setting and signs it by tone signal according to brake of new mode. <b>ATTENTION:</b> From now on Controller is armed, and any „throttle stick“ moving will cause the motor to start!	

he mode settings will be stored. From now on Speed Controller works with the programmed mode. Disconnect power battery and switch off the receiving. For other settings proceed as usual.

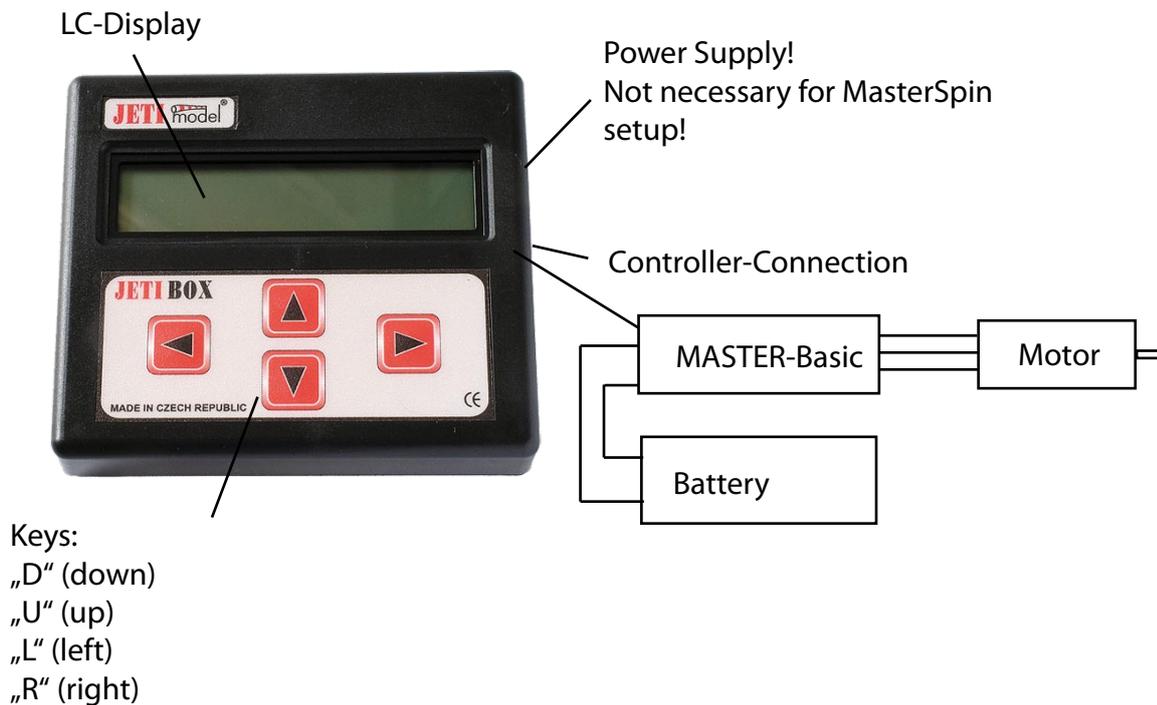
## 7. 7. Change settings of Master Basic-Speed Controllers by JetiBox

All Master Basic-Speed Controllers can be programmed optionally, in addition to the transmitter programming, by the JetiBox (programming box). The JetiBox allows full access to all settings and offers very comfortable programming.

Diese JetiBox bietet darüberhinaus folgende Möglichkeiten:

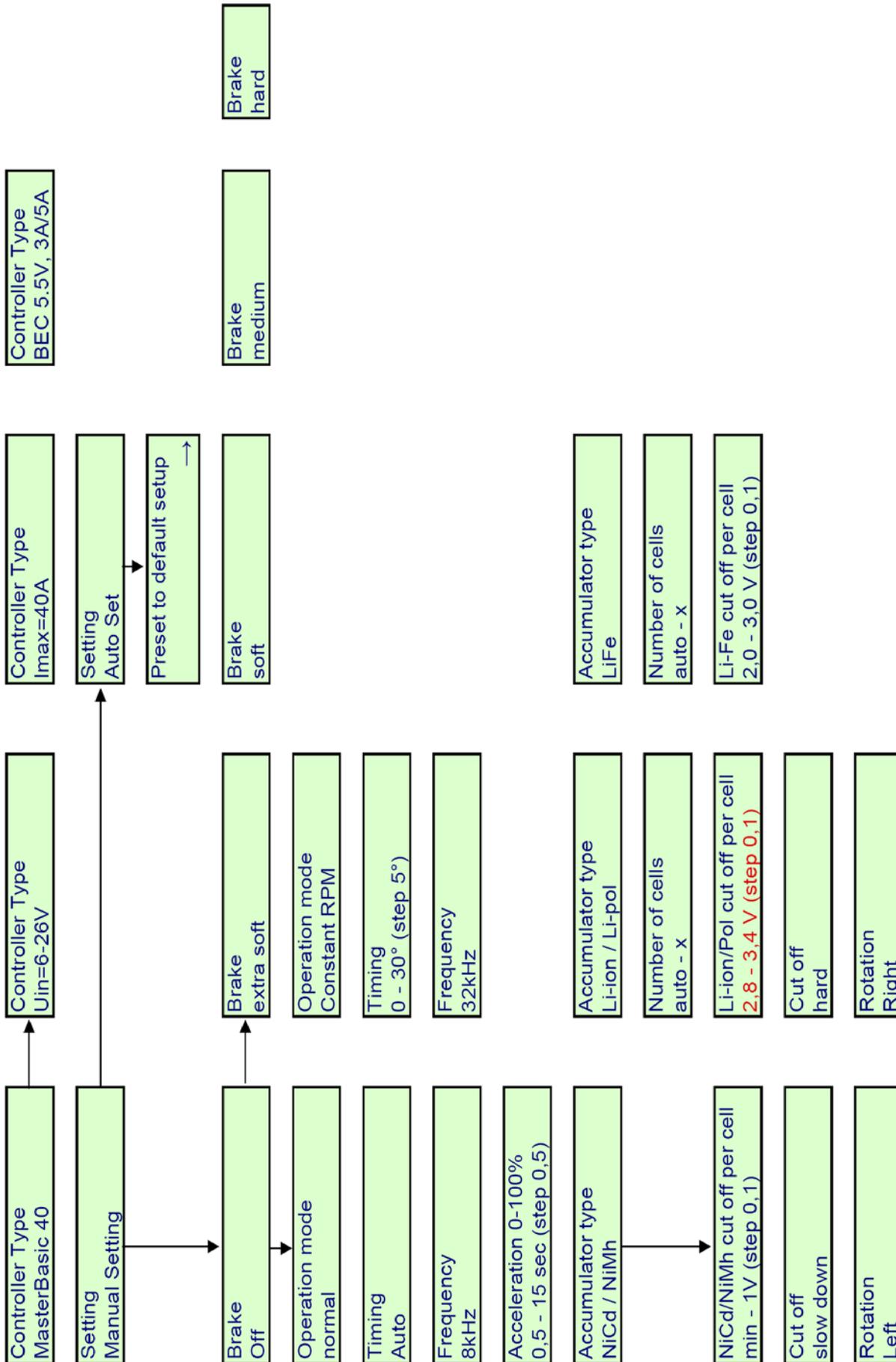
1. Servotesting Unit
2. Measuring of Servospeed
3. Measurement of pulse widths at the receiver output
4. Communication with SPIN controllers
  - Detailed adjustment of parameters
  - Read out adjusted parameters
  - Read out of values recorded by the controller during flight

### Programming of Master Basic ESC:



JetiBox is not included in delivery with your Speed Controller.  
Please check, how to use, the manual, which is added in the JetiBox supply.

7.1 Programming options with JetiBox



## 8. Declaration of conformity

The described products are in compliance with the relevant and applicable EC guidelines for electromagnetic compatibility:

89/336/EWG

92/31/EWG

93/68/EWG

## 9. Protection features

Master Basic-Speed Controllers are fitted out with a couple of monitoring devices to protect the Speed Controller as well as to care about the proper use of reception signals.

The protection functions guarantee the correct functioning of Speed Controller and motor in the whole speed and current area. But they can't protect against inadmissible handling and operating conditions like for example short circuits or a reversed polarity of power battery.

The Speed Controller protections switch the motor off if:

- The Speed Controller reaches a temperature of 100° C (= 215 ° F) This is the basic setup and can be adjusted with the JetiBox! However, this does not protect against short cuts.
- The battery voltage drops under the minimal operating voltage of the respective type.
- The current drain is strongly distinguish in different phases (asymmetrical load).  
Speed Controllers do not have a current monitoring. The protection is only made by temperature monitoring
- If no valid receiver signal is received for more than 3 sec. Besides, the Speed Controllers processor checks the input after a logical mathematic procedure. If correct impulses are received again, the motor would be restarted.

## 10. Warranty

Any Speed Controllers has to pass several tests during production. We emphasise a high quality standard. Therefore we provide 24 months warranty to our Speed Controllers.

The warranty consists, during the guarantee time, in a free of charge repair service for proved material defects. We reserve device changing, if repair is impossible for economic reasons.

As voucher for beginning and expiration of the warranty serves invoice issued by product acquisition. Possible repairs do not extend the warranty period. Incorrect application or operations, e.g., by polarity reverse, over voltage or wetness, avoid warranty claims.

This is also considered for faults based on strong wear or excessive vibrations.

Further claims, for example secondary damages, are expelled. The liability for losses by the device or its application is also expelled.

Any shipping to Hacker Motor GmbH must be free of charge; unfree shipping will not be accepted. We can not take any responsibility for transport damages or loss of your shipment. For any warranty recover following conditions must be fulfilled:

- Add invoice for Sped Controller purchase into the package
- The Speed Controller has to be used in accordance with its operating instructions
- The Speed Controller has to be used in accordance to the voltage and currents range indicated by the technical data
- The following form must be filled out and included:

**<http://www.hacker-motor.com/images/Reparaturauftrag.pdf>**

## 11. MASTER-Basic-Controller - Technical Datas

Typ	Betriebsspannung/Zellenzahl	Maße (mm)	Innenwiderstand (mOhm)	Switching BEC	Max. Servoanzahl	Helimodus aktivierbar	Gewicht in Gramm	Strom Dauer (2,2Ah batt.)	FETs
Type	Operating Voltage / Cell count	Dimensions (mm)	Resistance (mOhm)	Switching BEC	Max. Servo-number	Helimode / constant RPM inside	Weight in Grams	Nomina-Current (2,2Ah. batt)	FETs
MASTER-Basic 44	6-18NC /2-6 LiPo/6-26V	65x25x10	2 x 2,0	✓	6	✓	42	44	24
MASTER-Basic 55	6-24NC /2-8 LiPo/6-34V	65x25x16	2 x 1,1	✓	6	✓	55	55	48
MASTER-Basic 70	6-18NC /2-6 LiPo/6-26V	69x25x12	2 x 1,0	✓	6	✓	54	70	48
MASTER-Basic 90 Opto	14-36NC /4-12 LiPo/12-50V	75x55x17	2 x 1,1			✓	112	90	48

\* mit guten Kühlung und Umgebungstemperatur unter 20°C

\* with good cooling and outside temperature under 20°C

\*\* gilt für Wettbewerbstypische Einschaltzeiten

\*\* valid for typical runtime in competition

## 12. FAQ (Frequently Asked Questions)

<p>How do I connect a motor (three black cables) to the Speed Controller (blue, red, and yellow cable)?</p>	<p>Simply connect one black cable to one coloured cable. If the motor turns in the wrong direction, just swap any two of the three cables. Additionally the rotation can be changed by programming with the JetiBox for all MasterSpin Controllers.</p>
<p>Do I need a JetiBox to set the controller for Li-Io / LiPo battery use?</p>	<p>Basicly, you can set one of five modes with your transmitter. In all of these modes there is LiPo-Cut Off enabled. This is a LiPo-Autodetect with a slow down on 3,0V/cell. Please Note! LiPo-Autodetect only works correct if LiPo-Pack is fully charged when conected! For further LiPo-Setup, please use JetiBox!</p>
<p>Which Speed Controller timing is best for my motor?</p>	<p>Timing 0..4°: Hacker-Brushless Motor Series B-20, B-40 and B-50, as well as C-40 and C-50 Motors and all other 2-pole Inrunner. Timing 0..10°: 4-pole Inrunner Timing 5..18°: 6-pole to 8-pole Inrunner Timing 24°: For Motorseries A-20 to A200, as well as other 10-pole to 14-pole outrunner motors. Timing 24..30°: 14-pole and more. Please check the manual of your motor!  With the JetiBox the timing can be changed in 1° steps (from 0° to 30°). This allows fine tuning for „special cases“.</p>
<p>My motor has no brake any more. Is my motor damaged?</p>	<p>No. In most cases it's not the motor's fault. Most probably the Speed Controller is set to other mode by accident. This can happen if the controller is started up while the throttle stick is in „full power“ position. Please check if can hear only one „Beep“ after start up of the Speed Controller. In case you hear two „Beeps“ change the mode to your prefered mode.</p>
<p>My motor doesn't turn and only wobbles. Is my motor damaged?</p>	<p>Most probably not. In most cases this behaviour is caused by a bad connection between the Speed Controller and the motor. Check all connections. Change the connectors or re-solder bad connections if necessary. In some cases the cables are only hold in place by hear shrink tube. Bad connections cause an increased transition resistance. This may cause a loss of power, a not properly turning motor, up to complete destruction of the power stage.</p>
<p>I can't program my Speed Controller with the JetiBox. What do I make wrong?</p>	<p>Please check first if your Speed controller is featured with the necessary software. You must read the word <b>Master Basic</b> on the lable. The older MASTER Speed Controller series with label MASTER xx-3P or MASTER xx-Flight or Heli (xx stand for the operating current version) can not be programmed with the JetiBox. The software of a Speed Controller can not be updated. Please make sure the JetiBox is properly connected.</p>

<p>How do I connect the Jeti-Box for programming to the Speed Controller?</p>	<p>Connect the JetiBox to the Speed Controller. The motor must not be connected . If you connect a motor, do not mount the propeller or pinion to avoid injuries by rotating parts. At last connect the power battery. Without power battery the controller can't receive the programming commands.</p>
<p>My motor doesn't „Beep“ if I connect a battery to the Speed Controller!</p>	<p>Please check the following points:</p> <ul style="list-style-type: none"> <li>• Is the Speed controller properly connected according to this manual?</li> <li>• Is your speed controller in good order and condition (no mechanical or electrical damages visual)?</li> <li>• Is the BEC switch turned on (only for versions with BEC)</li> <li>• Is the receiver power turned on?</li> <li>• Is the receiver battery fully charged, properly connected and switched on (position ON / EIN)?</li> <li>• In case the „motor stop“ position is programmed to a fixed pulse value, the throttle stick and trim must be in the according position. The Speed Controller is only activated if the throttle stick is in the proper „motor stop“ position when started up.</li> <li>• Is the power battery fully charged? If a cutoff voltage is programmed, the voltage of the power battery must exceed the cutoff voltage.</li> </ul>
<p>My motor is not running until „1/3 throttle“ position and the speed can't be commanded sensitive.</p>	<p>Most probably the throttle stick ATV adjustment is not set to 100% for both side or the throttle stick is not in the proper „motor stop“ position when the Speed Controller is started up. In mode automatic initial point the Speed Controller may assume a higher throttle stick position as „motor stop“ position. This reduces the usable throttle stick resolution. As result the Speed controller can't be commanded fully sensitive. To adjust the correct throttle stick throw disconnect the power battery. Please make sure your ATV adjustment is set to 100% for both side, your throttle stick is in the proper motor stop position and the trim is in neutral position. Than re-connect the power battery. The Speed Controller initial point will be new adjusted (if automatic mode is set).</p>
<p>Can I dump the stored settings of a Speed Controller to a Prog-Box?</p>	<p>es! The JetiBox works like a Display and Keyboard.</p>
<p>Where can I get help if I have further questions not explained in the manual?</p>	<ol style="list-style-type: none"> <li>1. Ask the authorised dealer where you bought your Speed Controller</li> <li>2. Look for further information on our homepage <a href="http://www.hacker-motor.com">www.hacker-motor.com</a></li> <li>3. Send an email to: <a href="mailto:service@hacker-motor.com">service@hacker-motor.com</a></li> <li>4. Call our service via phoner: +49 871-953628-0</li> </ol>
<p>Is it possible to run two or more motors on only one Controller?</p>	<p>No! Only one motor can be used with one Speedcontroller! If you have only one batterypack, you can connect both ESCs parallel. If you use more batterypacks, all packs must be connected parallel! If you use BEC-Typ ESCs, only ONE BEC can be used. All others must be switched off!</p>





Benutzerinformationen zur Entsorgung von elektrischen Geräten und elektronischen Geräten (private Haushalte)  
Entsprechend der grundlegenden Firmengrundsätzen der Panasonic-Gruppe wurde ihr Produkt aus hochwertigen Materialien hergestellt, die recycelbar und wieder verwendbar sind.

Dieses Symbol auf Produkten und/oder begleitenden Dokumenten bedeutet, dass elektrische und elektronische Produkte am Ende Ihrer Lebensdauer vom Hausmüll getrennt entsorgt werden müssen.

Bringen Sie bitte diese Produkte für die Behandlung, Rohstoffrückgewinnung und Recycling zu den eingerichteten kommunalen Sammelstellen bzw. Wertstoffsammelhöfen, da diese Geräte kostenlos entgegennehmen.

Die Ordnungsgemäße Entsorgung dieses Produkts dient dem Umweltschutz und verhindert mögliche schädliche Auswirkungen auf Mensch und Umwelt, die sich aus einer unsachgemäßen Handhabung der Geräte am Ende ihrer Lebensdauer ergeben könnten.

Genauere Informationen zur nächstgelegenen Sammelstelle bzw. Recyclinghof erhalten Sie bei Ihrer Gemeindeverwaltung.

Für Geschäftskunden in der Europäischen Union

Bitte treten Sie mit Ihrem Händler oder Lieferanten in Kontakt, wenn Sie elektrische und elektronische Geräte entsorgen möchten. Er hält weitere Informationen für Sie bereit.

Informationen zur Entsorgung in Ländern ausserhalb der Europäischen Union.

Dieses Symbol ist nur in der Europäischen Union gültig.



Information on Disposal for Users of Waste Electrical and Electronic Equipment (private households)

This symbol on the products and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.

For proper treatment, recovery and recycling, please take these products to designated collection points, where they will be accepted on a free of charge basis.

Alternatively, in some countries you may be able to return your products to your local retailer upon the purchase of an equivalent new product.

Disposing of this product correctly will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

For business user in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

Information on Disposal in other Countries outside the European Union

This symbol is only valid in the European Union.

If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.



Hacker Motor GmbH  
SchinderstraÙ 32

D-84030 Ergolding

Tel: +49 871-953628-0

Fax: +49 871-953628-29

E-Mail: [info@hacker-motor.com](mailto:info@hacker-motor.com)

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