VBAR CONTROL *touch*

OWNER'S MANUAL

Mikado
Model Helicopters

VBAR CONTROL TOUCH
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BENEFITS AT A GLANCE

Software Highlights:

- Setup, programming and adjusting of VBar-controlled models accomplished directly via VBar Control radio.
- Readily understandable graphic user interface.
- Easy programming for new models via the familiar VBar setup wizard.
- ESC setup wizard for programming all types of speed controllers.
- ESCs with VBar Control support can be programmed directly from the radio.
- Up to eight parameters can be fine-tuned simultaneously, using the optional inputs. With adjustable limitation of the the respective range of values.
- Bank switching with three banks (fourth Bank for Autorotation optional).
- Real time logging and real time graphic vibration analysis available on the screen.
- Graphical telemetry log analyzer for stored flights (overview, energy consumption, event-log) directly readable on the screen.
- Create your own screen design directly on the touch-screen display.
- Full manual available on the radio, by means of context sensitive help.
- Easy bind process: allows to bind and fly any model equipped with VLink (e.g. a buddy‘s model), with your own transmitter (Model Sharing).
- Automatic power-on from Standby, if an already bound model is switched on.
- Several telemetry functions are available, such as voltages, current, rpm, speed, temperature and power consumption of the batteries (may need additional hardware).
- Multiple timer functions available with warnings and reminders via sound, voice, or vibration output.
- Wireless buddy boxing with two VBar Control radios, fully configurable.
- Interact with your smart phone via WiFi (control your music player, exchange photos, open web sites or videos, expand your display for telemetry purposes ...) —Apps for Android™ and iOS™ are under development, will be released later on.
- Cloud functions under development (e.g. for archiving, interaction with other users; usage optional).
- Access our App Store and do over-the-air online-updates via WiFi*.
- Over-the-air online-update your VBar NEO-flybarless systems via WiFi* (for purchases, a device with internet access and web browser is required).

* Online features require a WiFi connection and a device with internet access. Data transfers may cause additional costs, depending on your mobile data plan.

Hardware Highlights:

- Extra bright capacitive 5.8 inch multi-touch color display, with ambient-light sensor to automatically control the brightness.
- Very good readability even in bright sunlight.
- WiFi module connects to your WiFi network at home as well as to your personal hotspot on the go.
- Very fast start-up time, from fully off to fully operational in three seconds.
- High perfomance, low power controller for best user experience and long runtimes.
- Reliable 80 Channel 2.4 GHz FHSS bidirectional flight control, programming/setup and telemetry remote control system.
- Unlimited model memory.
- Virtually unlimited number of control channels.
- High range, low latency, antenna diversity both on transmitter and receiver.
- Intelligent antenna monitoring and management.
- Fully equipped with four 3-position switches, two 3-position quick-break-switches as well as six rotary inputs (four trim wheels, two rotating knobs), all fully programmable.
- Precision gimbals with four ball bearings, fully adjustable.
- Collective stick can be equipped with optional throw limiter.
- Delicate rubber lining for comfortable, slip-free and safe holding.
- Well-balanced with two-point neck-strap attachment, no additional retainer bracked required.
- Large 2 Watt loudspeaker for alarms and voice output.
- Vibration alarm (adjustable).
- Memory accessible as a USB memory stick, no drivers needed.
- Built-in Lithium Polymer battery allows for long run times.
- Charge through USB connector or built-in charger.
- Power supply for fast charging included.

INTRODUCTION

Welcome to VBar Control

Thank you for choosing this highly specialized yet versatile product. To safely operate and fly your radio controlled models using VBar Control, you must read and follow this device manual carefully. For software and model setup, see the context sensitive help on-screen as well as the quick start guides and/or manuals optionally provided with this radio, as well as documentation provided with the necessary components, such as motor, electronic speed controller, servos, the model kit itself. For latest information, new features and updates, please visit our product web site www.vstabi.info.

VBar Control and the VBar Control accessories are developed and manufactured in Germany. They are state-of-the-art products following highest quality and safety requirements. Every device has been inspected thoroughly during manufacturing and initial programming. VBar Control meets European requirements (ETSI) as well as US-American requirements of the Federal Communications Commission (FCC). VBar Control has been flight-tested thoroughly. Highest standards with regard to high noise immunity and operational reliability have been applied.

☝ **Attention** Unforeseeable changes in manufacturing processes and software development make this manual subject to change without notice. Mikado Model Helicopters strongly recommends that you visit the product web site www.vstabi.info regularly to get the latest information regarding your VBar Control transmitter.

☝ **Attention** Mikado Model Helicopters strongly recommends connecting VBar Control to a WiFi network on a regular basis, and do an online update using the **App Updater** located in **Transmitter Settings**.

☝ **Attention** We provide general information and video tutorials on our support web site www.vstabi.info/VBar_Control.

☝ **Attention** For service and support regarding programming and operation of your VBar Control and other Mikado products, please contact your local dealer or visit our product web site www.vstabi.info and the technical support forum there. Please also check out our FAQ on www.vstabi.info for frequently asked questions about VBar Control.
Telephone and e-mail support are available through

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What is VBar Control?

VBar Control is an advanced multi-function FHSS radio control system for all kinds of remote controlled models. With it's unique concept of programming and operation, it is the ideal companion to go with your radio-controlled and VBar-equipped models.

Purpose, Modifications and Export Regulations

VBar Control is designated for use with model helicopters, model airplanes as well as other remote controlled models. VBar Control is not designated for any other purpose than remote control of models for recreation or hobby.

Outside of the country of manufacture, VBar Control has to be approved by the laws applicable in the country of import, especially regarding emission of radio frequencies. On every re-export, VBar Control may be subject to regulations. Prior to use, approval of the relevant authorities may be required. If in doubt, contact your dealer to ensure that all regulations applicable have been met. VBar Control must not be used to control other than unmanned radio-controlled models on line of sight.

Mikado Model Helicopters takes no responsibility for any modification or replacement of parts on VBar Control. Any modification other than described in the product documentation may render the warranty void.

Icons used in this Manual

☝ **Attention** Problems and physical damage or physical injury may occur if not followed carefully.

⚠ **Warning** Dangerous conditions may occur, causing serious physical injury or death, or massive physical damage, if not followed carefully.

☠ **Danger** Dangerous conditions may occur, causing death, serious physical injury or high physical damage if not followed carefully.

☒ **Procedures** and actions that are prohibited.

☑ **Procedures** or actions that are mandatory.

GENERAL SAFETY PRECAUTIONS

Precautions for the Use of the 2.4 GHz Band

VBar Control operates in the 2.4 GHz band, which is in common use with e.g. industry, science and medical (ISM) applications. It is widely used for microwave ovens, short-range wireless communications like WiFi, bluetooth, cordless appliances like headphones, or amateur radio. Excessive use of the 2.4 GHz band (like in urban areas) may degrade the control response and range of VBar Control. If you experience adverse radio interference, immediately stop using VBar Control.

In public places, such as airports, hospitals, or racetracks for example, special limitations may apply.

Transmission is impeded or blocked when any objects are in the line of sight to the model. This degrades control response or even causes the model to go out of control. Always operate a radio-controlled model so you can safely control it within line of sight.

Handling the VBar Control

Check that all parts and manuals are provided in this box (see package contents on page 9). Turn on VBar Control and check that the battery is charged properly. If in stand-by-mode, you can see the state of charge by tapping the touchscreen with two fingers. We recommend that you connect your VBar Control to the wall charger, or to a personal computer using the USB cable to fully charge the battery. We also recommend to connect VBar Control to a WiFi network and perform an online update (**Transmitter Settings**, **App Updater**).

If there are any items or manuals missing, please immediately contact your local dealer or the service department of Mikado Model Helicopters.

⚠ **Warning** Never use VBar Control on rainy days or if there is any precipitation. Electronics may malfunction if they get damp or wet.

⚠ **Warning** Never disassemble or modify VBar Control beyond what is described in this manual. Heat, fire or an electric shock may cause injury or physical damage.

⚠ **Warning** The power unit (engine/motor/gears) as well as rotating parts (rotor head and blades, tail rotor head and blades, propellers, wheels etc.) may start up at high speeds, causing danger.
Always turn on VBar Control first, and make sure the throttle stick/switch is set to the lowest/motor off position, then turn on the receiver/model. Make sure that all fail safe precautions regarding an electric speed controller are met. Connect a flight pack only when sticks and switches are set to lowest/motor off position. When turning off power, always turn off the receiver/model first, also disconnect the flight pack. Note: as a safety precaution, VBar control can only be turned off after the connected VBar Flybarless controller and receiver have been turned off.

⚠ **Warning** Pay full attention when setting up an electronic speed controller (ESC) or an IC engine. Injury or physical damage can be caused.
Do not start an IC engine with the throttle set to a high rpm position. Injury or physical damage can be caused.

⚠ **Warning** When using components from other manufacturers, you must make sure that all components in the system are compatible with each other. Especially the power supply of the radio control system as a whole must be suitable to meet the needs of all appliances connected. Malfunctioning components or components drawing too high a current, or generating back voltages, may disrupt the safe operation of the radio control system as a whole.

⚠ **Warning** VBar Control, a VBar Control Receiver as well as VBar and VBar NEO units and the other components are sensitive to shock. Avoid hard impacts. Do not drop them. This may cause malfunction.

⚠ **Warning** If you detect that control degrades, stop operation of your model, check battery and general condition, do a range check, check the event log. The model may get out of control, causing injury or physical damage.

⚠ **Warning** Never operate the model next to known radio interference, passing vehicles or people, next to high-voltage power lines, buildings, and be careful in mountainous areas. The model may get out of control, or malfunction may occur, causing injury or physical damage.

⚠ **Warning** Every electronic component that has gone damp or wet may malfunction at any time, even if it seems to work again normally after being fully dried. Do not continue to use such components and contact the service and support of the company for the product for a check-up.

☝ **Attention** Do not spill fuels or liquids from the exhaust of a combustion engine on VBar Control: they can leave permanent marks on surfaces. Remove such residues immediately.

Attention Keep your touchscreen display clean. Use a soft cloth and only non-aggressive detergents to clean it. Hard or abrasive foreing particles may scratch the glass surface.

Danger When setting up your radio, make sure you do not assign two vital functions to the same switch, e.g. *Motor Switch*, *Safety Switch* (optional) and *Throttle Cut* (*Motor Off* on IC powered models), they must be set to independent switches.

Attention Familiarize yourself with the switch assignment, especially with *Motor Off*, so you flip the proper switch even in case of an emergency (e.g. loss of control). Do as safe test run on the ground, without main and tail rotor blades, propellers, wheels, to familiarize yourself with the operation of the model, and check the action of the governor/ESC. If your are setting up an IC powered model, check the action of the throttle servo and the carb when switching the several states of the Motor Switch and when actuating the Throttle Cut switch.

Attention Before any radio control operation, check the following:

» Are the batteries charged fully/sufficiently?
» Is there enough fuel in the tank?
» Are any liquids spilled on the electronics, like water or fuel?
» Make sure all linkages are secure and no slop or binding occurs in operation.
» Make sure that the overall vibration level on the model is low, and that all control functions work reliably when the power unit and drive train are running at the expected rpm.
» Make sure all fail safe precautions are met: in case of a loss of control the motor/engine must turn off.
» When running the power unit/drive train, keep clear of rotating parts and mind the danger of main or tail rotor blades, propellers or wheels spinning.
» On the first operation of a newly set up model, select a safe place for takeoff, landing or driving, and test the control functions and operation close by but at a safe enough distance for several minutes. Do not test at distances too far away.
» Familiarize yourself with safety precautions, such as how to switch off the motor in case of any unwanted/uncontrolled operation. This is to take the energy and vibration out of the system. Be prepared to attempt an emergency landing/autorotation.

Attention VBar Control will warn if the battery level falls below 3.5 V. VBar Control will switch off automatically when the battery level falls below 3.2 V except when a model is connected (safety feature).
As a safety measure, the touchscreen display will eventually power down in a low battery situation, to save energy for the radio control operation.
Land immediately and turn off the model/stop operation of your model, if a battery warning occurs.

Built-in Rechargeable Lithium Polymer Battery and Battery Charger

■ Take special care with the following to prevent unwanted heat generation, fire and explosion.

Danger Use only the supplied wall charger with the appropriate adapter. Check the voltage in the country you are in, it must not exceed 100-240 V AC.

» Do not misconnect (+) and (–)
» Do not place VBar Control or the charger next to heat or open fire.
» Keep open terminals (+) and (–) away from conductive materials like metal surfaces, carbon fibre, tools.
» Never disassemble or modify VBar Control beyond what is described in this manual, and never use a soldering iron on the electronics.

Danger Never use batteries other than those sold by Mikado Model Helicopters. The batteries have been carefully selected and adapted for use in VBar Control. Always monitor the charging process, even though the integrated charging circuit takes care of the proper charging parameters. Stop the charging process immediately if the device gets hot.

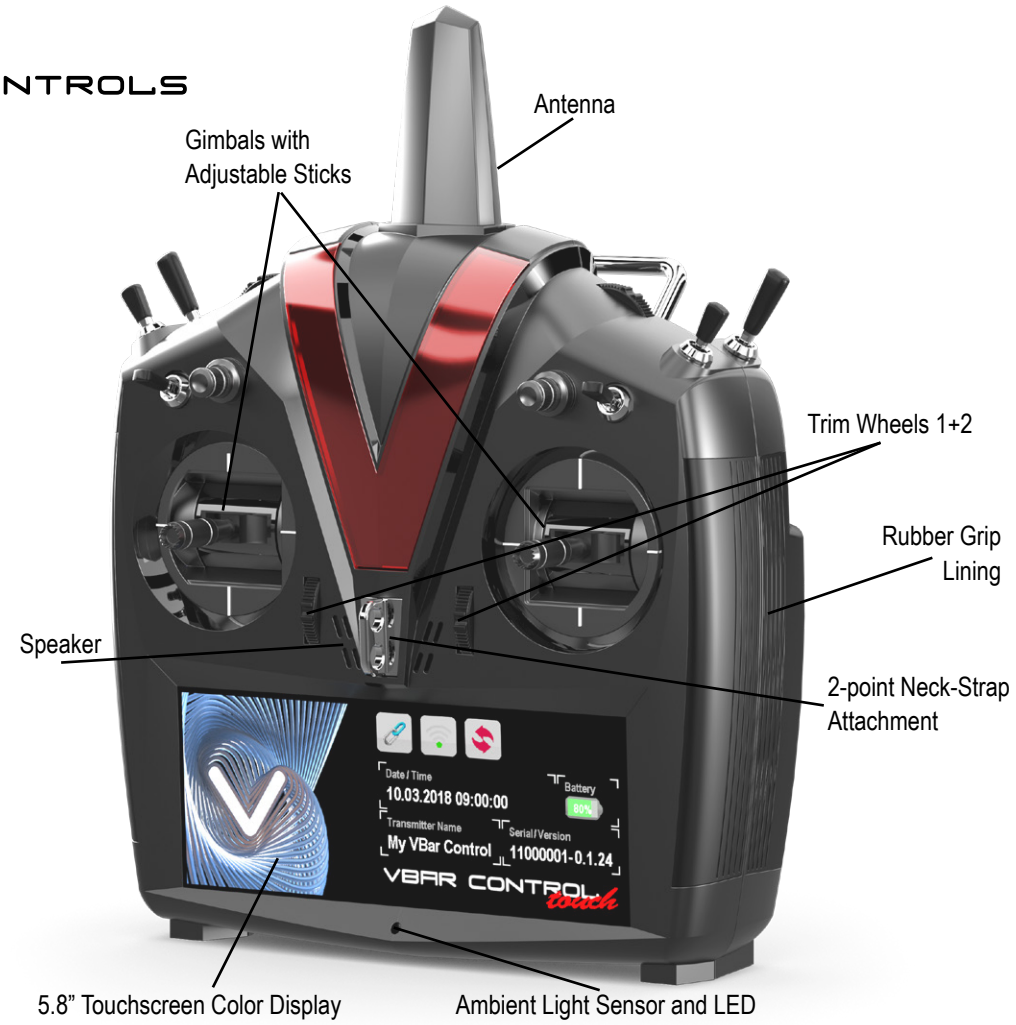
» Never allow the battery to have any contact with liquids.
» Never damage the insulation, connecting wires, connectors.
» Stop using a battery that has taken damage to the insulation, connecting wires, connectors.
» Battery liquids are dangerous. If your eyes, skin or clothes come in contact with these, rinse thoroughly and wash your clothes with clean water.
» Always monitor the condition of your batteries by checking the operating time and charging time. When operating times or charging times start to differ strongly, the end of a battery's lifetime may have come.
» Battery failure may cause your model going out of control, causing dangerous situations.

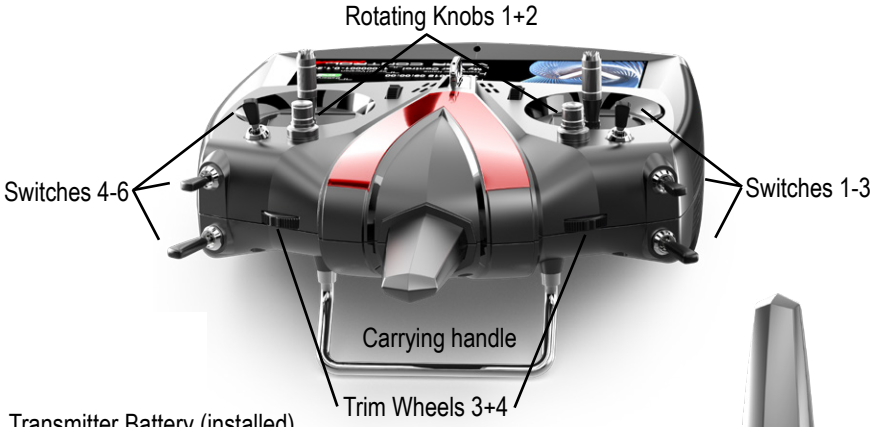
Attention Never store your VBar Control and the battery in high temperature, or in very dusty or very humid conditions.

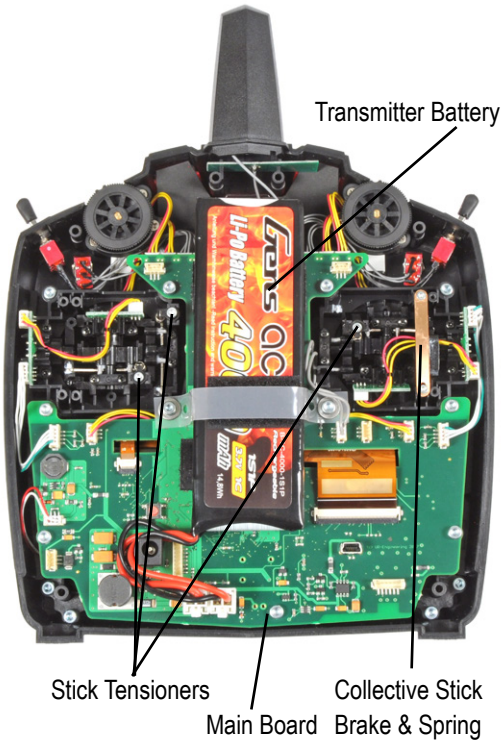
» Store the VBar Control and the battery outside of the reach of infants and children.
» Never charge the battery of your VBar Control in very cold conditions (lower than 0 °C/32 °F).
» A used Lithium Polymer battery is not domestic waste. To dispose of a Lithium Polymer battery, discharge the battery, insulate the terminals with tape. Then take it to a store/dealer who can dispose of small rechargeable batteries, or take it to a collection point for harmful substances.
» Never keep the VBar Control in direct sunlight for an extended time. Keep it in the shadow when it is not used.

TRANSMITTER CONTROLS AND FEATURES

- Antenna
- Gimbals with Adjustable Sticks
- Trim Wheels 1+2
- Rubber Grip Lining
- Speaker
- 2-point Neck-Strap Attachment
- 5.8” Touchscreen Color Display
- Ambient Light Sensor
- Rotating knobs 1+2
- Switches 1-6
- Carrying handle
- Trim Wheels 3+4
- Transmitter Battery (installed)
- Power Button
- Stick Tensioners
- Main Board
- Collective Stick Brake & Spring
- Charging Connector with Protective Rubber Cover
- USB Connector with Protective Rubber Cover







PACKAGE CONTENTS

- VBar Control Transmitter
- Neck strap
- USB lead
- Wall charger
- This manual

PARTICULAR FEATURES OF VBAR CONTROL TOUCH

VBar Control Touch sports a couple of particular features, which make everyday use even more convenient.

Context Sensitive Help

You will notice that this manual only covers the basic operation of VBar Control itself. The manual for each and every setting, parameter and additional app is available directly on the radio, by means of a (?) button. This way, you can consult the manual directly whenever necessary, and even jump between settings or apps and the manual at any time. Additional information can also be available online (e.g. to video tutorials), in this case there will be a QR code to scan with your smart phone, and a readable link which you can type into a browser address line.

Standby Mode

If in Standby Mode, VBar Control can be powered on by swiping from right to left, on the touchscreen. Standby Mode has distinct power saving features. If you do not use your VBar Control for a prolonged time, it will switch off completely, to conserve battery charge, and depending on the current state of battery charge.

- At ≥ 50 % battery charge, VBar Control will remain in Standby Mode for 6 hours.
- At ≤ 30 % battery charge, VBar Control will remain in Standby Mode for 1 hour.
- At ≤ 10 % battery charge, VBar Control will not enter Standby Mode but switch off completely.

Active Idle

If enabled, VBar Control will monitor the 2.4 GHz band in Standby Mode and automatically switch on if a previously bound VBar NEO/Receiver Satellite is switched on.

Hint In Standby Mode with Active Idle enabled, the radio only draws approx. 60 mA, so it does not affect the overall operating time very much, even if the radio is in Standby Mode with Active Idle enabled during a whole day of use.

Hint If you disable Active Idle, the radio will only draw approx. 25 mA in Standby Mode.

WiFi Connectivity

The built-in WiFi module connects to your wireless network at home or to your personal hotspot on the go. It is as simple as selecting the SSID (name) of the network from a list and typing in the password. VBar Control will automatically re-connect every time the radio is switched on, and if one of the known WiFi networks is present.

Hint You can switch off this connectivity in the Transmitter Settings, but we recommend to leave it turned on so you have access to the online features at any time.

App Store

If online, you have direct access to the App Store (see **Transmitter Settings** / **Shop**), to load and install additional Apps.

App Updater

If online, you can update your radio and the Apps on it at any time, to the latest version.

Multi Touch Gestures and Context Menu

VBar Control Touch features a couple of gestures and the option to open context menus or additional settings.

- Touch and hold with two fingers will call up the battery state if VBar Control is in Standby Mode.
- Touch and hold with two fingers will enable/disable a Screen Lock if VBar Control is running.
- Touch with three fingers will create a quick screenshot, independently from the switch assigned in the Screenshot App.
- If an item on the screen has a blue triangle marker to it, a long touch will show a context menu or a secondary set of settings.

BASIC TRANSMITTER OPERATION

How to turn VBar Control On and Off

VBar Control has two different states for power-off: **OFF** and **STANDBY**.

- Turn on your VBar Control by pressing down the Power Button on the back.
  - » If VBar Control is **OFF**, it will power on in approx. three seconds.
  - » If VBar Control is in **STANDBY**, it will also power on in approx. three seconds.
  - » If VBar Control is in **STANDBY**, you can also swipe from right to left on the touchscreen, to power it on.
- Bring your VBar Control in **STANDBY** mode by swiping from left to right on the touchscreen **OR** by pressing the Power Button on the Back, then press the red button on the touch screen.
- To turn off your VBar Control completely, press and hold the red button, then confirm in the context menu.
- Mind that you cannot turn off your VBar Control as long as a model is connected, so always turn off your model first.

Attention You can force VBar Control to switch off by pressing the power button for 15+ seconds.

⚠ **Warning** Please mind that, in this case, the radio can not shut down it's internal drive properly and a data loss or data corruption may occur. Always switch off normally, if possible.

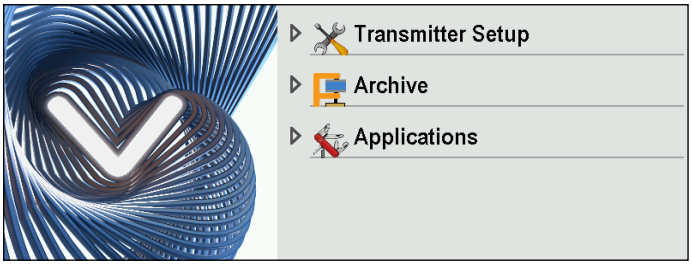
Battery Charging

- The built-in battery will be charged every time VBar Control is connected to a personal computer, using the USB cable. A green light will come on in the ambient light sensor right below the sceren, when the VBar Control is connected to a live USB port.
- To charge VBar Control without a PC, connect the wall charger provided to a wall outlet. Select the appropriate adapter for your country.
- Connect the charger to VBar Control.
- A red light will come on in the ambient light sensor right below the screen, when the VBar Control is connected to the wall charger.
- Charging time from the wall charger will be up to three hours. The battery is full when the LED turns off.
- When left connected to the wall charger, trickle charge will keep the battery fully charged.
- Charging time from a USB port will be up to twenty hours (with the transmitter turned OFF). If the transmitter is turned on, the USB port will only be able to buffer the system.
- You may connect both the USB cable and the wall charger at the same time. The integrated charging circuit in your VBar Control transmitter will always use the input with the highest power and disable the other input.
- In case the battery is exhaustively discharged, the charging time will increase noticeably, to safely get the battery back to life.

THE TOUCHSCREEN INTERFACE

Main Screen

- On powering on, the main screen shows the current date and time in the center of the screen.
- The transmitter battery status is displayed next to it, with an icon and the percentage.
- The transmitter name is displayed below.
- The serial number as well as the current version number are displayed next to it.
- On top of the screen you see a line with icon short-cuts for Bind (chainlink icon), WiFi and Transmitter Settings. This Icon line will vary, depending on the model connected and the features available, like Rescue, ESC Setup and Telemetry and so on.
- If there are multiple screens, you can swipe up and down to navigate.



- To access the main menu, swipe to the left, from the right hand margin of the touchscreen. To close the menu, tap the free area on the left or just swipe it back.
- By Scrolling up and down, you can navigate the main menu.
- Menu items with a submenu have a triangle/arrow symbol next to it, while menu items which directly access an app, feature or function don't.
- **Transmitter Settings** contains all basic settings for your VBar Control including the App Store and your personal settings for Buddy Boxing.
- The **Archive** collects flight and battery related logs (entries appear as you use the radio with your models).
- **Applications** will take up settings for specific Apps you did download and enable on your radio.

Show me More

- Certain menu items can be magnified if you tap them, e.g. the live event log in the lower right corner of the default screen, if a model is connected.

On-Screen-Manual

- To access the context sensitive manual, tap the (?) icon on the right hand side of a panel or screen.

Navigation

- If page contents exceed the height of the screen, you can scroll up and down, usually a scroll marker on the left hand side will show you where you are in the content, approximately.
- To close menu items, parameter panels or Apps, tap the red button on the right hand side or tap the free area outside a popup-box or parameter selector.
- All changes to settings will be made instantly, no need to save settings.

Additional Functions and Context related Menus

- If there are additional functions to an item on the screen, you will see a blue triangle marker in it's upper right corner. Tap and hold the menu item, and either a context menu or a secondary function will pop up.
- Certain functions have a context menu by default, like WiFi (to refresh, log in, disconnect etc.).

- If you have the User Defined Main Screen App installed, you can tap and hold in the free area of the screen to instantly change the contents of the current screen. Here again, you can tap and hold to pull up a context menu with the available screen items (only system related items if no model is connected, also model related items if a model is connected, and depending on the capabilities/options you have on the model).

Switch on and off with Gestures, in Standby Mode

- To switch off the radio (to Standby Mode), swipe from left to right, then tap the red button. To abort, just tap outside the red button. The model must be powered off of course.
- To switch on the radio again (from Standby Mode), swipe from right to left.

Hint If this doesn't work, the radio is probably not in Standby Mode, press the Power Button on the back instead.

More Gestures

- To check the battery state (in Standby Mode, screen off), tap the screen with two fingers.
- To lock the screen (to avoid accidental changes to parameters), tap and hold with two fingers on the screen (a sound will play and a popup will appear briefly).
- To take a quick screenshot of the current display, tap the screen with three fingers (a shutter sound will play).

Enjoy Exploring

Now explore the menu items available as long as no model is connected. If you are not familiar with a specific menu entry or setting, consult the online help at any time.

Once a Model is connected

... the main screen will change to the default model screen, and new menu items will appear, corresponding to the device connected, and it's capabilities.

- **Model Setup** is the place to go, to set up your model.
- **Model Status** shows information about the VBar unit connected as well as the vibration analysis (scroll down) and the event log (scroll further down).
- **Flight Parameters** allows to change parameters per Bank (use the bank switch to select).
- The list of menu entries may vary, depending on the capabilities of your model, e.g. the Rescue Settings will only appear if a corresponding license is found on the VBar.

Reminder all features, settings, parameters, Apps are explained directly on the radio, just tap the (?) icon to learn more.

BIND AND FLY

If you have models which are already set up, you can just bind, do a pre-flight-check, and go flying.

⚠ **Warning** Do not forget to make all necessary radio settings like stick mode, switch assignments the way you want it, the way you are used to it.

How to change the Stick Mode and adjust the Stick Tension, how to change the Stick Length

- Tools needed: 3 mm and 2 mm hex screwdrivers, PH0 x 50 Philips screwdriver, pliers.
- Turn off your VBar Control transmitter
- Remove the neck strap.
- Put the VBar Control transmitter face down on a soft surface.

① Remove the six screws M3x20 mm to take off the bottom case. Then flip the case over so the screws fall out of the bottom case.

- Flip the still-closed transmitter 90° to the left, and carefully start opening VBar Control like a book.
- Carefully disconnect the both switch wires and the vibration alarm motor, and open the VBar Control fully, like a book.
- Do not touch the main board!

② Locate and unscrew the metal brakes from the existing throttle stick.

- If the stick mode is already OK for you, just remove the stepped brake.

③ Unplug the wire going through the plastic brake.

④ Unscrew the plastic brake on one end and unhinge it on the other end.

⑤ Reconnect the wire, make sure to fix it in the plastic clip.

⑥ Unscrew spring tensioner of the existing elevator stick (next to the battery, to the left or to the right).

- Gently unhinge the spring and remove both the plastic holder and the spring.

⑦ Remove the metal bracket by gently pulling it out, away from where the spring was attached.

⑧ Disconnect the wire which now has to go through the plastic brake.

⑨ Carefully thread it through the opening in the plastic brake and fix the wire in the plastic clip.

- Re-connect the wire.

⑩ Fix the metal brake and tighten to your liking.

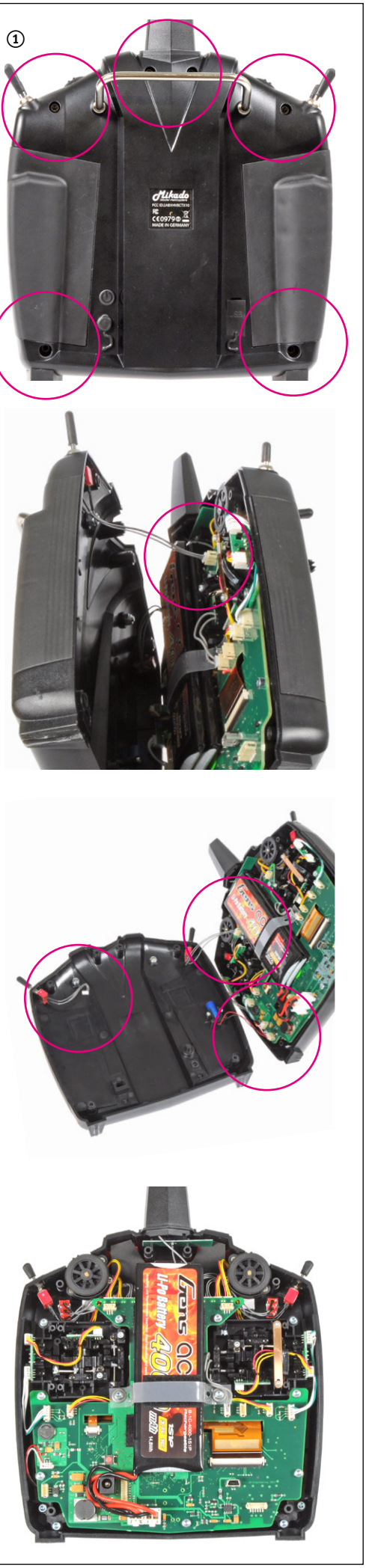
- Use the inner holes for a smooth brake feeling, or the outer holes for a stepped brake feeling.

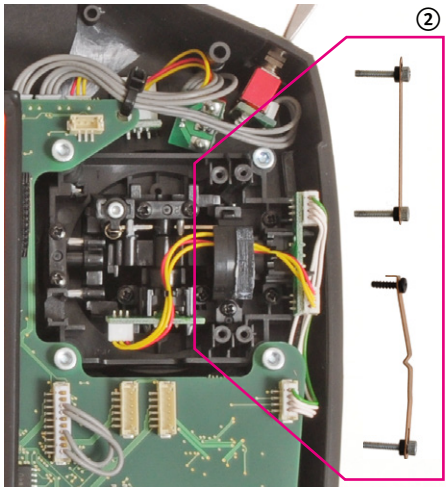
⑪ Place the metal bracket 180° from it's original position on the other side, under the future elevator stick.

- Take care that everything is rotated 180° compared to where you dismounted the parts.

⑫ Put the plastic holder in the slot, and hinge the spring to the bracket and the plastic holder. You may use the cable tie from the USB lead, and form a hook to handle the spring. **The wire to the elevator gimbal must lie flat on the connector board there, such as not to bind against the bottom case when the elevator stick is moved to it's end position.**

- Adjust the springs on all sticks to your liking.
- Carefully close the VBar Control again, and re-connect the switch wires and the vibration alarm motor.
- Carefully replace the bottom case, **so as not to squeeze or damage any wires.**
- Fasten the six screws but do not over-tighten them.
- To change the stick length, carefully twist the upper half of the stick counter-clockwise to loosen the stick, while holding the lower half. Adjust the lower and the upper half to the length of your choice. Fix the stick by twisting both halves against each other.

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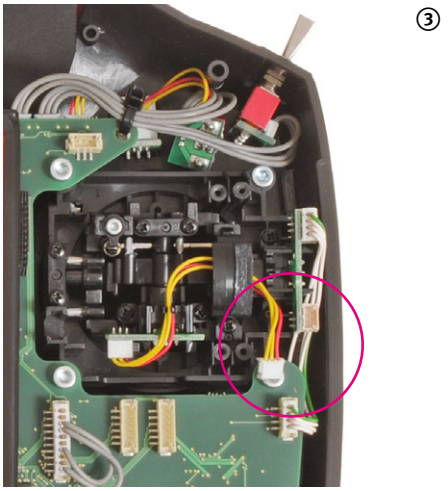
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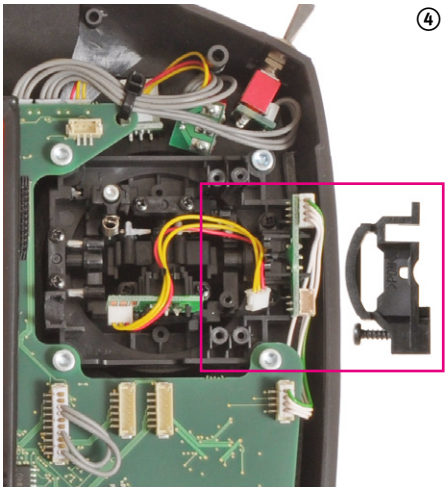
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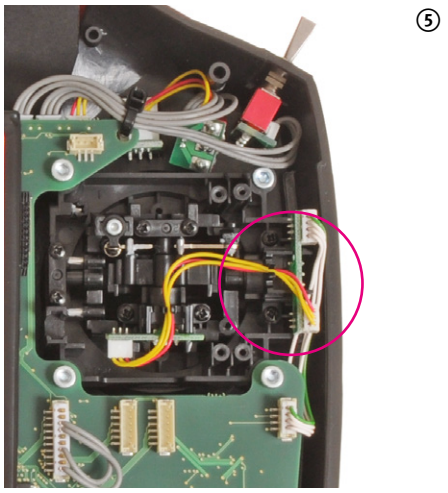
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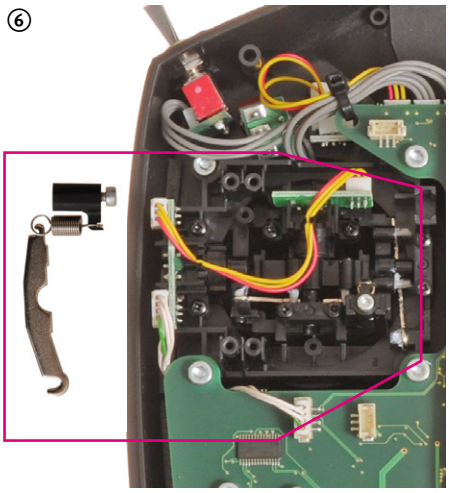
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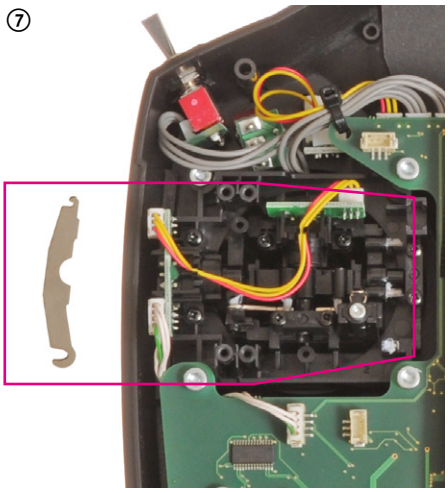
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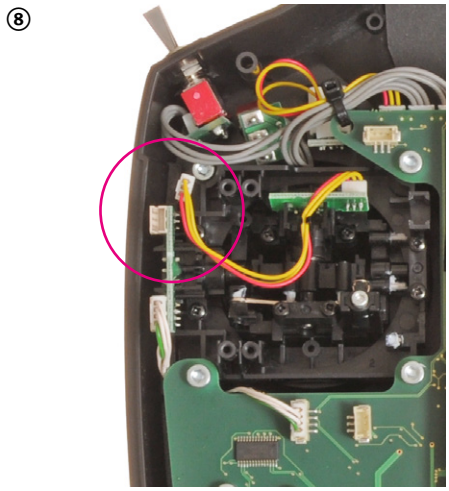
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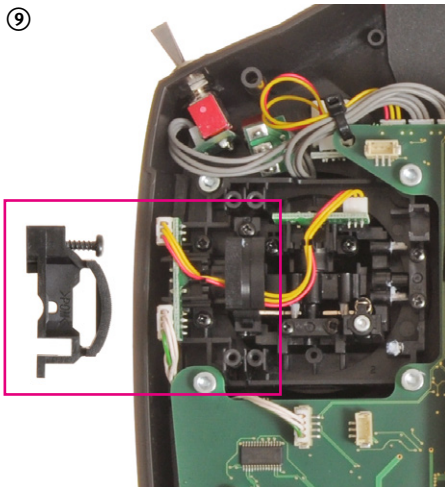
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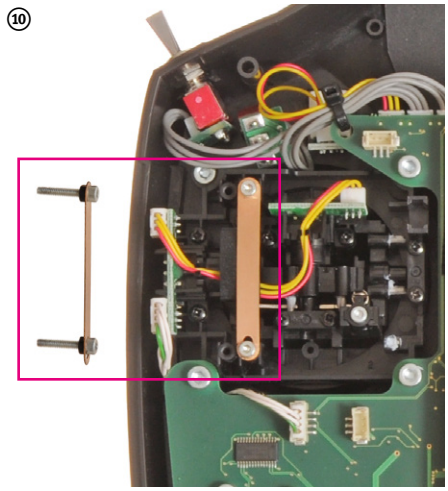
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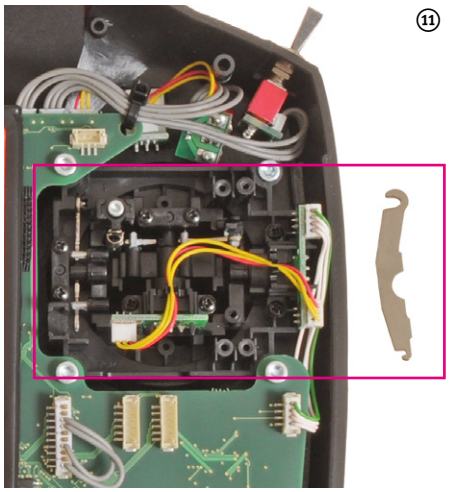
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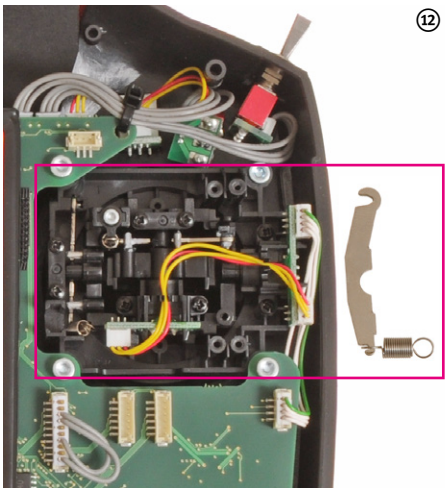
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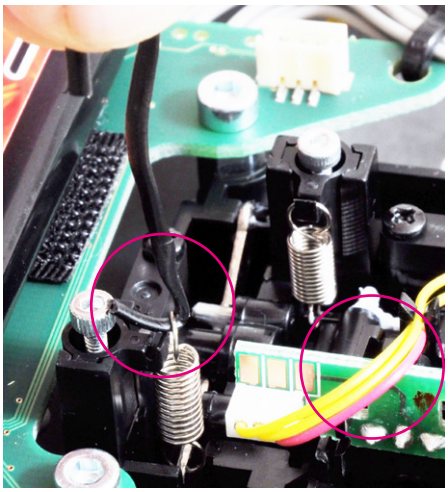


How to use VBar Control as a USB Game Controller

- VBar Control's USB connector is acting as a HI device by default.
- Just connect the USB lead to your computer.
- There is no driver needed on Windows PCs nor on Macs. The operating system will detect VBar Control automatically as a game controller.
- In your preferred simulator software, select VBar Control as a controller and set up/calibrate as needed.

Attention Use the Simulator's menus to adjust the Simulator to the VBar Control transmitter. Do not change settings (e.g. switches) in your VBar Control transmitter; this will affect behavior of your real-life models, too.

Binding a VBar Control Satellite Receiver or a VBar NEO VBasic or VBar NEO VLink

- Option 1
  - » Turn on VBar Control transmitter.
  - » Make sure motor/throttle controls are in OFF position.
  - » Select **Bind** from the **Main Screen**.
  - » Turn on the VBar NEO or VBar with the VBar Control Satellite Receiver connected.
  - » Wait a few seconds for the VBar Control to scan for available devices.
  - » Select the VBar device from the list.
  - » VBar Control will confirm with the message 'Connected'.
- Option 2
  - » Turn on the VBar NEO or VBar with the VBar Control Satellite Receiver connected.
  - » Wait for 10 seconds for the receiver to go into bind mode.
  - » Only now turn on VBar Control transmitter.
  - » Make sure motor/throttle controls are in off position.
  - » Select **Bind** from the **Main Screen**.
  - » Wait a few seconds for the VBar Control to scan for available devices.
  - » Select the VBar device from the list.
  - » VBar Control will confirm with the message 'Connected'.

Attention If the re-binding procedure is no completed, a previously bound VBar or VBar Control Satellite Receiver remain bound to the last VBar Control transmitter it was bound to. The binding information is not automatically deleted by mistakenly powering up the model. Just turn the model off, turn on your VBar Control transmitter, then turn on the model again: it will re-connect at once.

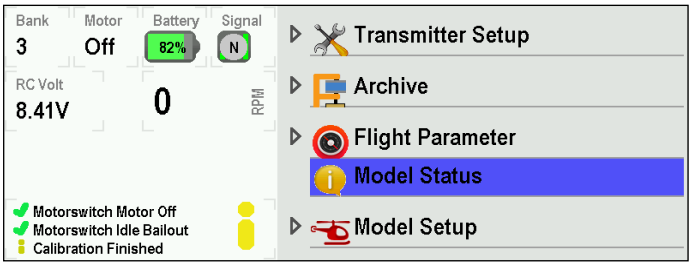
Active Idle

If Active Idle is enabled in the Transmitter Settings, VBar Control will monitor the 2.4 GHz band, even if it is in Stand-by Mode.
If VBar Control detects a VBar device which was already bound, it will switch on automatically.

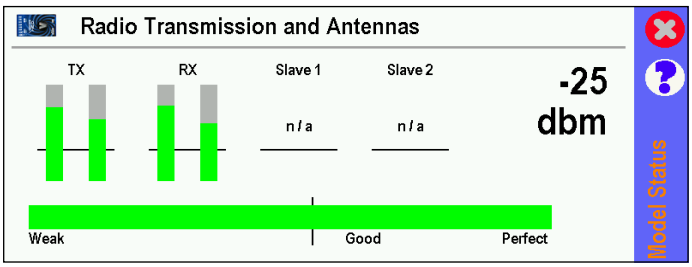
Attention To bind a model to a different radio while it's original radio is in range, unbind the model first in the Model Settings/Model Tools dialog (VBar NEO of the 2nd Generation), or switch off your radio completely (swipe, tap and hold the red button, confirm). Else the original VBar Control will always come awake if the VBar is turned on.

Tips for using your VBar Control Transmitter

- Power saving
  Set the low threshold of the ambient light sensor to a low value, so the transmitter always uses the least power needed for the display.
- You can use the Boost feature in **Transmitter Settings**, this way the display will brighten once you move the radio.
- Range check, check of antennae



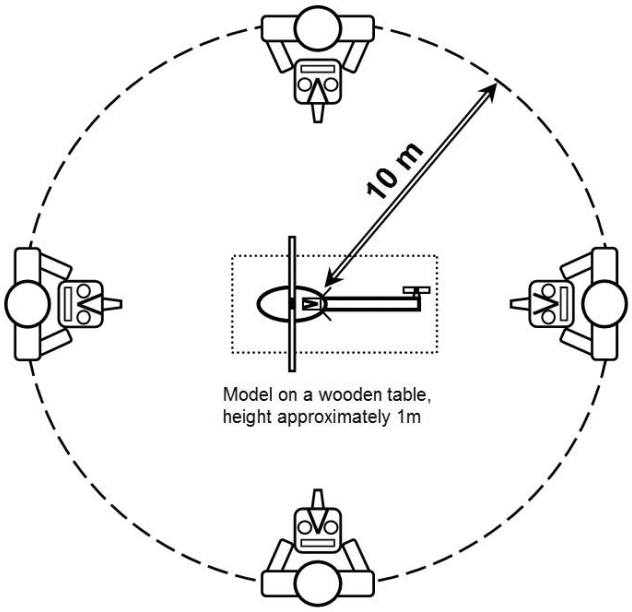
Once a VBar Control Satellite Receiver is connected, you can check the antenna status at **Model Status/Antenna Status**. You will see bars indicating the overall link power as well as the signal strength of the four antennae (Tx=radio, Rx=receiver).



⚠ **If** one of the four vertical bars falls below the indicated threshold, stop using VBar Control and find and remedy the cause.

☑ **Check** the antenna status of VBar Control and the bound receiver frequently, at least at the beginning of every day of use.

For a range check, walk around your model in a 30 ft/10 m radius. Point the antenna of VBar Control at the model as if you were flying it. Link power may not read below the vertical threshold line.



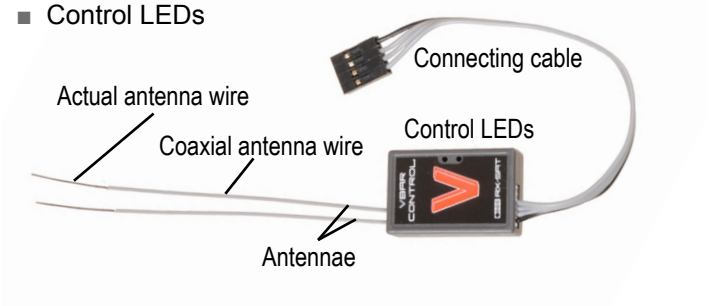
⚠ **If** link power falls below the vertical threshold line, re-arrange the antennae and repeat the test.

☒ **Do** not place the model onto a metal surface for this test.

VBAR CONTROL SATELLITE RECEIVER

Features

- Antennae
  - » Coaxial antenna wire
  - » Actual antenna wire
- Connector
- Connecting cable (for Mikado VBar or Mini VBar only, a cable with a connector for VBar NEO (non VLink) can be purchased separately)
- Control LEDs



☝ **Attention** The black lead points to the black triangle marker at a main unit's control panel connector, or to the embossed triangle marker on a Mini VBar.

Control LEDs

- The green LED signals that the receiver is bound to and synchronized with VBar Control.
- The red LED flashes when data are being sent, e.g. telemetry is active.

☝ **Attention** As long as VBar Control is not in bind mode, or the Satellite is not/yet bound, no LED will light up.

VBar Control Receiver Installation

- Place the receiver next to the VBar Flybarless controller.
- Fix it using e.g. double-sided adhesive tape or velcro tape. Make sure it does not touch the frames/chassis directly, to avoid vibration influence.
- Avoid places where liquids could spill on the receiver, take waterproofing measures if necessary.
- Avoid places where high temperature changes can occur.
- Take measures so wires or antennae do not get damaged e.g. by sharp-edged carbon fiber or aluminum frames.
- Make sure the connector is securely attached and the wire is not subject to tension and that they are not bent or kinked.

Placement of Antennae in the Model (also applicable for VBar NEO VLink)

- Place the antennae in a way so the actual antennae do not touch frames or chassis elements. The free space around the tip should have the size of a table tennis ball.
- If the actual antennae touch conductive or shielding material such as metal or carbon fiber surfaces, the reception will be reduced considerably.
- Align the antennae in a way so they point at a 90° angle.
- Separate the antenna tips as far as possible, their mutual distance is even more important than achieving a 90° angle.
- Do not unnecessarily cover the actual antennae.
- Do not bend or kink the actual antennae.
- The coaxial wires may be bent, but only in a gentle arc, not 90° sharp, so as not to damage the actual antenna wire inside.
- Separate the antennae as far as possible from electric motors, electronic speed controllers or other sources of electric/electronic noise.
- Separate the antennae as far as possible from conductive or shielding materials/surfaces. When installed inside a fuselage, try and place the antenna tips outside the fuselage.

☝ **If** you are mounting the VBar Control Satellite inside a fuselage, always perform a comprehensive range check.

FAIL SAFE

Attention VBar Control's pre-programmed Fail Safe-Settings will set the servos to hold and the ESC/trottle servo to the known motor off-position, both if the connection between satellite and VBar is interrupted and if the radio connection is interrupted or broken. This way, the energy is taken out of the system as much as possible, and the model is left on a hopefully predictable trajectory.

Attention If the connection can be re-established, (e.g. after temporary radio interference), you regain control immediately. On an electric heli, the motor will spool up quickly, the same as from bail out/idle. A combustion engine will not regain power. Land/autorotate the model immediately and find/remedy the cause before flying again.

Attention In case the connection to the model or VBar breaks, VBar Control will notify **Connection broken** and advise to turn off the motor switch. Turn off the motor at your own discretion: we recommed turning off the motor before the model hits the ground, to avoid further damage.

⚠ **Warning** Always set the motor switch to 'Motor Off' position when approaching a crashed model: in case the connection can be re-established, the motor will otherwise spool up again.

CARE AND CLEANING

Attention Use a soft brush to remove dirt and sand from surfaces and from the gimbals, to avoid scratches.

Attention Use a dry or damp microfiber or other soft cloth to clean the surfaces. Do not rub firmly. Only neutral detergent may be used (check on a hidden surface first if in doubt).

Attention Take special care when cleaning the display, foreign parts like dirt or sand for example might scratch the surface even when a soft cloth is used.

Attention Do not use dripping wet cloth, and do not use hot water, benzine, gasoline, model fuels, thinner or other volatile detergents for example, as they might permanently damage or mark surfaces or damage the electronics inside.

GETTING SUPPORT AND SERVICE FOR YOUR VBAR CONTROL

Warranty

Mikado Model Helicopters offer free warranty repair or replacement during the legal warranty period applicable only if VBar Control is faulty during or after use according to the specification and this manual, and based on the regulations of Mikado Model Helicopters.

Mikado Model Helicopters will charge cost for repairs or replacements necessary e.g. because of improper use, after the warranty period, and without proof of purchase provided.

Warranty will be limited to the VBar Control itself and does not cover other components on the model like servos, power units, the model itself and especially non-Mikado products.

Mikado Model Helicopters do not take responsibility for any physical damage or physical injury as well as loss of use or data saved on the device or any similar claim.

After the warranty period has expired, or in case the damage was not a warranty issue, Mikado Model Helicopters will repair VBar Control with costs. We will provide a repair estimate to the customer.

Repairs will only be made if VBar Control can be used safely again in the future.

Please note that costs of some repairs might exceed the value of the device and might not be economically sensible.

Attention Legal warranty periods may differ depending on the laws applicable in the country you live in. Please ask your local dealer/distributor for further details.

Attention Make sure you save the files on your VBar Control to your computer before you send it in for warranty or general repair. The device may be reset and re-installed at the service shop, causing loss of all data saved on the internal memory.

After-Sales Service

Mikado Model Helicopters provides extensive worldwide after-sales service on the forums at the support web site www.vstabi.info as well as via e-mail through service@mikado-heli.de.

Spare parts and accessories for your VBar Control are available at www.mikado-heli.de.

TECHNICAL DATA

VBar Control Transmitter

Working temperature range	0 °C to +40 °C 32 °F to 104 °F
Current consumption	Standby 25-60 mA Normal 420 mA Maximum 1,350 mA
Weight	approx. 970 g

VBar Control Satellite Receiver

Working temperature range	-5 °C to +45 °C 23 °F to 113 °F
Current consumption	Receive max. 70 mA Transmit max. 80 mA
Supply voltage	3.5 to 8.4 V (2S LiPo)
Weight	8 g

VBar Silverline

Working temperature range	-5 °C to +60 °C 23 °F to 140 °F
Current consumption	ca. 120 mA
Supply voltage	3.5 to 8.4 V (2S LiPo)

Mini VBar Blueline

Working temperature range	0 °C to +50 °C 32 °F to 122 °F
Current consumption	ca. 80 mA
Supply voltage	3.5 to 8.4 V (2S LiPo)

VBar NEO

Working temperature range	-5 °C to +60 °C 23 °F to 140 °F
Current consumption	ca. 120-170 mA (w. ext. Sensor)
Supply voltage	3.5 to 8.4 V (2S LiPo)

RECYCLING VBAR CONTROL AND THE RECHARGEABLE BATTERY

Recycling the Built-In Rechargeable Battery

Spent Lithium Polymer batteries are not domestic waste. Discharge the battery, insulate the terminals with tape or similar, and bring it to a store/dealer that disposes of small rechargeable batteries, or bring it to a collection point for harmful substances.

VBar Control Transmitter and Receivers

Used electronic devices are not domestic waste. You can reduce the environmental impact of electronics through proper recycling. Please refer to your local regulations or contact your local dealer to learn how to dispose of used small electronic devices properly.

COMPLIANCE INFORMATION FOR EUROPE

Simplified Declaration of Conformity

Mikado Model Helicopters declares that the radio system VBar Control is compliant with directive 2014/53/EU.
The full Declaration of Conformity can be found on the internet, at www.mikado-heli.de.

Safety Instructions

Danger An R/C controlled helicopter is not a toy! While moving, the rotor blades pose a serious danger to persons and things. You must obey all safety instructions of the manufacturer for operation of your helicopter.

Attention VBar is not an autopilot! VBar may be installed in helicopters which are suitable for flying without flybar. During installation and operation you must follow all instructions given in the software and in this manual. VBar may not be operated in wet conditions (high humidity or rain). If the helicopter shows vibrating behavior during flight, operation of the helicopter is to be stopped immediately. Do not continue flying until the cause for vibration has been eliminated.

Caution When setting up, disconnect the motor wires or remove the pinion gear to avoid accidental spooling up of the helicopter while setting up the speed controller (ESC) functions. The same applies when loading unknown setup or preset-files, as they may transport other settings as you have on your heli!

Attention Never connect the Gyro-Sensor to a port other that it's own or it will be destroyed immediately and beyond repair.

Attention Never connect power to RX A, RX A is signal transmission-only.

Attention A heli equipped with VBar draws higher currents than a conventional flybarred heli. Make sure you use a sufficient power supply.

Attention polarity is always shown on the label of the VBar. The brown lead (negative terminal) of the servo connectors must point to the label. For extra connectors on e.g. VBar Silverline, see the markings on the label, too.

Attention Additional power supply may be connected to any free port on the servo side (Mini VBar: do not use RX A for power supply, if necessary use Y-harnesses).

Attention USB is only used for firmware updates. Do not connect at the same time with a VBar Control Satellite.

Note: the remaining connectors may be used for special functions (e.g. retractable landing gear, light). Information will be provided in the relevant manuals to specific Apps. You can download these manuals from www.vstabi.info.

Attention If you chose to use a VBar with other radio control systems, please refer to the Quick Start Guide provided on www.vstabi.info. You must install a different firmware on the VBar for use with other radio control system.

Attention When using Telemetry, do not connect a signal wire (orange or white wire, e.g. from a slave power supply wire of a BEC) to RX C (Mini VBar) or AUX (black, blue or silver full size VBar), this might interfere with the telemetry signal.

Wiring your VBar NEO/Mini VBar/VBar

Servo/Function	VBar NEO	Mini VBar	VBar Silverline
VBar Control Satellite	AUX 2/3 (optional)	CP	Control Panel
Non-Mikado receiver (see manual to the respective VBar)	AUX 1, TELE 1, TELE 2	RX A, RX B, RX C, RX-1, RX-2	AUX, Elevator, Aileron, Colle/ESC, Rudd/AUX 2, RX1, RX2
Swash plate (the actual assignment is shown in the setup wizard)	CH1 CH2 CH3 CH4	CH1 CH2 CH3	Channel 1 Channel 2 Channel 3 Channel 4
Tail rotor servo	TAIL	RD	Tail Servo
Electronic speed controller (ESC)	ESC	RX B	Colle/ESC
Throttle servo (Nitro)	ESC	—	Servo
RPM sensor **Note** RX A (on a Mini VBar) and Sensor II (one a full size VBar) must not be used for power supply to the VBar!	RPM (has receiver voltage, so check if your sensor can handle e.g. 8.4 V / 2S LiPo, else you might need a voltage regulator (similar to the one for a tail servo).	Signal lead (usually orange) to RX A, upper pin; supply voltage e.g. to RX C using a Y-harness. Attention: do not apply more than 5 V on RX A, for higher receiver voltage use a voltage divider.	Sensor II **Note** If an rpm signal lead does **not** require 3.3-5 V receiver voltage or also serves a BEC slave wire (e.g. YGE ESCs), you can (BEC: must) connect (+) and (–) wire(s) to the front of the VBar.
Gyro sensor	SENSOR (optional)	—	Gyro Sensor
Telemetry (only with VBar Control)	TELE 1, TELE 2	RX-1, RX-2	RX1, RX2

VSTABI NEO
VBASIC RECEIVER

Included with the VBasic Receiver (depending on what product you did order) comes a Quick Start Guide.
More information can be found at www.vstabi.info/vbasic.
Information about how to get started with Macrocells can be found at www.vstabi.info/mc.
Please also take note of the Video sections for VBar NEO and VBar Control, where you will find many sample applications, explained step by step.

Apart from its wide range of features as a receiver, each VBar NEO VBasic can be updated to be a full blown VBar NEO with Pro and Rescue feature.

To do this, please connect your VBasic Receiver to your computer, start the VBar Control Manager software and go to our App Store via the 'Applications' Buton.
Prices for the different possible updates will be shown there. The purchase is processed via our online shop, and after payment has been received, your update will be enabled automatically.

VSTABI NEO
NON VLINK CONVERSION

When switching to VBar Control, from a different radio system, you can even update VBar NEO devices of the 2nd Generation to full blown VBar NEO VLink devices, with built-in receiver.

This is possible for devices which show the extension (non VLink) in your device list, on www.vstabi.info/devices, and if you have the VBar NEO VLink Crossgrade available as an option in our App Store.

You will need antenna wires of course, which we offer together with a new case for your VBar NEO, with the antenna grommet. Please use our Item No. 05062 (Conversion Kit VBar NEO to VBar NEO VLink).

In case the App Store does not offer the update, you have a VBar of the 1st Generation, where the receiver board was built in separately. These devices can not be updated. In this case, please use a VBar Control RX Satellite Item No. 04882 together with the Connecting cable VBar NEO / RX-Sat Item No. 04977.

More information about options can be found in our online shop at shop.mikado-heli.de, on the main page, right hand side navigation, please check out 'Updates for your VBar NEO'

Initialization
During Initialization, the VBar goes through a self-test. The helicopter must be at rest during this test.

» Note for Mini VBar: During the self-test, the V flashes (blinks). When the test is finished, you will see a brief twitching (jump) of the swash plate. Also the V stops blinking and will be lit up continuously.
» Note for VBar with external sensor: The V starts flashing blue-green-red in a sequence.

Pre-Flight Check
Before each flight you must double-check the active direction of the swash plate and the tail rotor. To do so, lift the helicopter up and move it along the three axis. The swashplate must tilt noticeably against the movement. The tail rotor must create thrust against the direction of rotation on the yaw axis.

» Note for VBar with external sensor: The sensor LED will show it's activity in three different colors: red for aileron, green for elevator, blue for tail.

Exemption from Liability
Mikado does not assume liability for completeness or correctness of the content of this manual and of the software provided.
The user assumes all liability for all potential damages or claims that might arise from the operation of the VBar and his helicopter.

Accessories
You will find accessories to be used with VBar on Mikado's website www.mikado-heli.de

SETUP OF A NEW MODEL

If you start a new model with VBar Control, or if you are new to VBar Control, these are the steps required:

- Set up your radio (Transmitter Settings).
- Bind the VBar NEO or legacy VBar with RX Satellite to your VBar Control, without the servos connected yet.
- Go to Model Setup/New Model and select the model type and/or size to start with, to load factory defaults into your VBar.
- Follow the Setup Wizard from top to bottom and make the required adjustments. The Wizard will guide you through the whole setup, show you the numbers or names of the physical connectors where to connect servos etc., and the (?) Online Help will always be available right on screen.
- Once the Model Setup is done, do a test run on the ground (without rotor blades/propellers/wheels etc. to avoid damage or injury), then you are good to go.

⚠ **Important** Before you begin to set up a VBar equipped model, you must adjust at least basic settings such as **Stick Mode** and **Switch Assignment**. You may also have to remove the stepped brake plate from the collective stick gimbal and possibly change the collective stick to match your preferred stick mode.

Danger When setting up your radio, make sure you do not assign two vital functions to the same switch, e.g. *Motor Switch*, *Safety Switch* (optional) and *Throttle Cut* (Motor Off on IC powered models). They must be set to independent switches.

Attention Familiarize yourself with the switch assignment, especially with *Motor Off*, so you flip the proper switch even in case of an emergency (e.g. loss of control). Do a test run on the ground, without main and tail rotor blades, and check the action of the ESC. If your are setting up an IC powered model, check the action of the throttle servo and the carb when switching the several states of the Motor Switch and when actuating the Throttle Cut switch.

Hint When you install additional Apps, which can be operated by Option Switches, make sure you set them up properly. For example, it makes no sense to have the function Screenshot on the same switch as e.g. the Motor Switch or the Bank Switch, this way you would create a Screenshot on every operation of the corresponding switch.

Updating an existing VBar or Mini VBar to communicate with your VBar Control Transmitter

Attention Do not connect the VBar Control Receiver Satellite yet. You may either connect the USB wire or a device to the Bluetooth/Control Panel connector, but not both.

- Log in to www.vstabi.info using your MikadoID (please check out our video tutorials on www.vstabi.info if you are not yet familiar with registration and online update of VBar Flybarless Controllers).
- Navigate to ‘My VBars’, check the list of devices registered to your MikadoID.
- If needed, register a new or used device to your MikadoID first.
- Click on the magnifying glass in the column ‘Options’ for the VBar in question. Click ‘Add VBar Control Version’ to enable the required firmware.
- Click on the globe icon below ‘License’ to get a license key for the device in question. You will receive an e-mail with a one-time link shortly.
- Click the link in the e-mail and follow the instructions on the screen.
- Use PC software 5.3+ (download available on www.vstabi.info) to perform File/Online Update for the device.
- Select 6.x firmware, click ‘Load’. Wait for the update to install, do not disconnect the VBar during the process. Make sure your receiver power supply is sufficient and that the USB lead is firmly plugged into the VBar (mind the rubber protector especially on a Mini VBar).
- Turn off your VBar, disconnect the USB lead.

Only now connect the VBar Control Receiver Satellite.

- Turn on your VBar again (wait for 10 seconds: this will bring the VBar Control Receiver Satellite into Bind Mode).
- Turn on your VBar Control Transmitter.
- Select **Transmitter Setup**, **Bind** from the menu.
- Select the VBar (serial number) of the VBar you are about to set up.

Attention When promped by the wizard, you have to re-set the servo arms during model setup of VBar Control to get them as close to the actual center postion as possible.

Attention Disconnect and remove the receiver of your old radio system from the helicopter.

Danger Disconnect the ESC or move the motor away from the main gear. This is to avoid the model accidentally spooling up during the setup process.

Attention On battery-powered helicopters, the ESC must ALWAYS must be connected to 'Colle/ESC' on a fullsize VBar with external sensor. In case it was connected to CH4 or Servo, please re-connect. On a Mini VBar, the ESC is always connected to RX B.

Attention On nitro-powered helicopters, the throttle servo must ALWAYS be conntected to Servo (on fullsize VBars with external sensor). In case it was connected to CH4 or Colle/ESC, please re-connect.

Danger Remove main rotor blades and tail rotor blades during setup and initial tests of the power unit and governor.

Attention After the update has been completed, the VBar is no longer accessible and can no longer be set up using the PC software. To perform an update to a newer 6.x firmware, you must load the recovery firmware first (see FAQ on www.vstabi.info).

Attention In case of an update gone wrong (interruption of the process, e.g. due to battery failure, computer crash, accidental disconnection of the USB lead or similar), please see our FAQ on www.vstabi.info on how to recover your VBar and start over.

Attention To switch back to VBar firmware for use with radios other than VBar Control, see our FAQ on www.vstabi.info on how to recover your VBar. After recovery, select an appropriate firmware from the list in 'File/Online Update' of the 5.x+ PC software. If necessary, get a license key from www.vstabi.info.

Attention You must create a new setup using the VBar Control's setup wizards for every VBar you convert to firmware version 6.x. Parameters will not be transferred on an already set-up 4.x or 5.x VBar. Setup files from older versions of the VBar software and firmware are not compatible and can not be loaded into the VBar by copying on the VBar Control's internal memory.

Attention VBar Control has only Apps for basic setup and flight operations installed by default. Go to **Transmitter Settings/Shop** to browse, install and en-/disable Apps.

Tail-Servo List

Manufacturer	Servo type	Frequency	Center pulse
ACE	DS0606	333 Hz	1.500 µSec
ACE	DS0606 n	333 Hz	760 µSec
Airtronics	94758	333 Hz	1.500 µSec
Airtronics	94761	333 Hz	1.500 µSec
Align	DS 520	333 Hz	1.500 µSec
Align	DS 525 M	333 Hz	1.500 µSec
Align	DS 620/650	333 Hz	1.500 µSec
Align	DS 651	333 Hz	1.500 µSec
Futaba	S 9253	333 Hz	1.500 µSec
Futaba	S 9254/9257	333 Hz	1.500 µSec
Futaba	S 9451	333 Hz	1.500 µSec
Futaba	S 9650	333 Hz	1.500 µSec
Futaba	S 3153	333 Hz	1.500 µSec
Futaba	S 3154	333 Hz	1.500 µSec
Futaba	BLS 451	333 Hz	1.500 µSec
Futaba	S 9251/9256	333 Hz	760 µSec
Futaba	BLS 251	333 Hz	760 µSec
Futaba	BLS 256 HV	333 Hz	760 µSec
Futaba	BLS 257	333 Hz	1.500 µSec
Graupner	HBS 770	333 Hz	1.500 µSec
Hitec	5925 MG	333 Hz	1.500 µSec
Hitec	6965 HB	333 Hz	1.500 µSec
Hitec	HSG-5083MG	333 Hz	1.000 µSec
JR	8900 G	333 Hz	1.500 µSec
JR	3400G	333 Hz	1.500 µSec
JR	2700 G	200 Hz	1.500 µSec
JR	8700 G	200 Hz	1.500 µSec
JR	810 G	200 Hz	1.500 µSec
JR	MP 80 G	333 Hz	1.500 µSec
JR	SPG 01	333 Hz	1.500 µSec
JR	MP 83 GWV	333 Hz	1.500 µSec
Logictech	2100 G	333 Hz	1.500 µSec
Logictech	6100 G	333 Hz	1.000 µSec
MKS	HBL 950 HV	333 Hz	1.500 µSec
MKS	HBL 980 HV	333 Hz	760 µSec
MKS	HBL 669	333 Hz	760 µSec
MKS	BLS 980/990	333 Hz	760 µSec
MKS	DS 95 i	333 Hz	760 µSec
MKS	DS 760	333 Hz	760 µSec
MKS	8910A	333 Hz	760 µSec
Robbe	FS 61 BB	333 Hz	1.500 µSec
Savox	SB-2272/2 MG	333 Hz	1.500 µSec
Savox	SC-1257 TG	333 Hz	1.500 µSec
Savox	SH-1290 MG	333 Hz	1.500 µSec
Sky	HDS-577	200 Hz	1.500 µSec
Sky	HDS-877	200 Hz	1.500 µSec
Torq	BL 9188 HV	333 Hz	760 µSec
Torq	BL 9088	333 Hz	760 µSec

Note: if your type of servo is not in this list, please look up the parameters in the manual of the servo or on the internet.