



- Vario



## Manual Version 1.3



### Introduction

The VSpeak Vario is available in a standard and a "pro" version. Most essential differences of the "**pro**" version are even **higher sensitivity of the Vario** and greater measuring range for acceleration (see Section 7).

The Vspeak-Vario is a sensor for measuring:

- relative altitude (atmospheric pressure)
- rising- /falling speed (Vario)
- voltage (receiver battery voltage and / or **drive battery single cell voltage**)
- **acceleration (... X, Y und Z-axis)**
- temperature (... of the VSpeak board)

The VSpeak Vario is compatible with the Multiplex Sensor Bus (MSB) and can thus can be used on multiplex and ACT receivers. The measured values of VSpeak-Vario can be visually displayed on the display's of the MLink telemetry transmitter or ACT S3D transmitter. MSB conform can the addresses of the measured values be programmed and alarms can be parameterized to the measured values.

All measured data can also be logged by VSpeak-Vario - and - with the help of Logview clearly presented and evaluated.

**Using the VSpeak speech module for MPX (ACT), all measurements and alarms of VSpeak-Vario are preferrably output as speech. For the rising / falling speed a variable vario-tone is generated.** Using the VSpeak speech module, a variety of individual settings for the announcements can be made (see instructions for speech module VSpeak).

**Because of its small size and light weight, as well as the ability of individual cell monitoring of a drive battery, the VSpeak-Vario is predestined primarily for use in small electric gliders.**

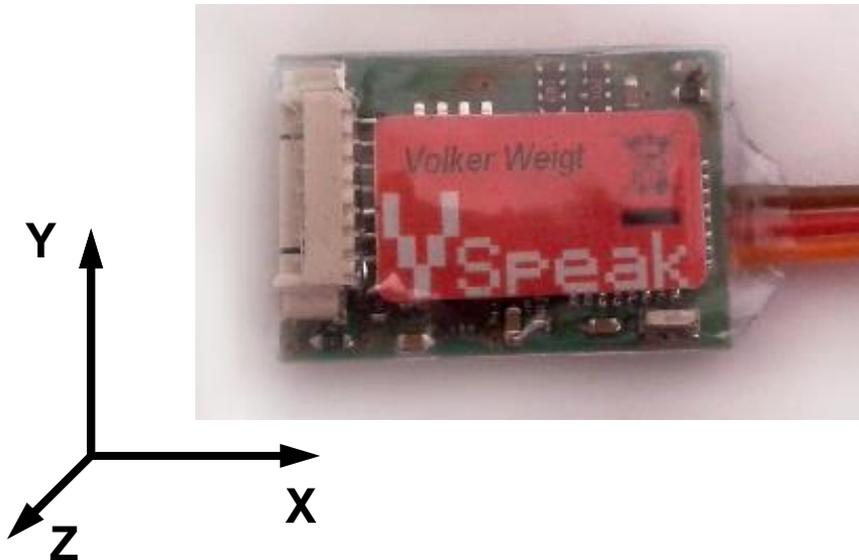
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## 1 Installation

The VSpeak-Vario can be attached with double-sided Velcro tape on the model. For the Velcro the smooth shrink tube level in the range of the SD card slot is suited. In the following picture, the orientation of the axes for the acceleration measurement is shown:



## 2 Connection

With the 3-pin. Servo connector (UNI) the connection to MSB receiver can be made directly to the telemetry inputs or via V cable for connection of several sensors.

**Attention ! While using multiple sensors on the MSB is essential to make sure you avoid address collisions (see Section 4.1). Each sensor address must only be assigned once.**

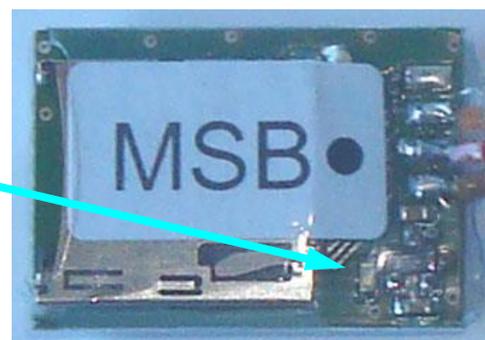
At the VSpeak-Vario jack for single cell voltage measurement balancer adapter can be connected (available as accessory).

**Attention ! First, connect the battery's negative and positive pole to the speed controller (or) BEC - as LAST balancer. Disconnect in reverse order, first disconnect the balancercable from the battery!**

For correct measurement of cells and the total voltage a ground connection between the negative terminal of the battery and the negative terminal of the receiver is necessary. For controllers with BEC, this connection is automatically done – BUT NOT in opto-controllers, there you have to make a ground connection separately.

### 2.1 Operation display

Error-free operation of the VSpeak-Vario is indicated by the "flashing" blue LED light.



### 3 Parameterization

#### 3.1 Address Management

According to the MSB specification, the addresses of the measured values which are transmitted on to the VSpeak-Vario to the MSB can be set / disabled (see Section 3.2).

It is to ensure that the sensors connected to the MSB use NO address multiple times.

##### 3.1.1 Default – factory settings

measured value	active	address	alarm	alarm value	description
Vario	ON	7	OFF	25.0 m/s	
total voltage	ON	3	OFF	9.0 V	voltage over all cells
cell voltage	ON	2	ON	3.0 V	voltage of the cell with the lowest voltage
altitude	ON	6	OFF	300 m	
acceleration X-axis	ON	12	OFF	4.0 g	display in „Amp“
acceleration Y-axis	ON	13	OFF	4.0 g	dto
acceleration Z-axis	ON	14	OFF	4.0 g	dto
temperature	ON	4	OFF	40.0 °C	
<b>MIN / MAX values</b>			<b>WITHOUT alarms</b>		
MIN total voltage	OFF	15	----	----	
MIN cell voltage	OFF	15	----	----	
MIN altitude	OFF	15	----	----	
MIN acc. X-axis	OFF	15	----	----	maximum for negative acceleration
MIN acc. Y-axis	OFF	15	----	----	
MIN acc. Z-axis	OFF	15	----	----	
MIN temperature	OFF	15	----	----	
MAX total voltage	OFF	15	----	----	
MAX cell voltage	OFF	15	----	----	
MAX altitude	OFF	15	----	----	
MAX acc. X-axis	OFF	15	----	----	maximum for positive acceleration
MAX acc. Y-axis	OFF	15	----	----	
MAX acc. Z-axis	OFF	15	----	----	
MAX temperature	OFF	15	----	----	

##### 3.1.2 Feature: Display of the acceleration values

For the acceleration no display is provided in the definition of the MSB. To be able to show the acceleration values anyway on the telemetry display, they will appear as "pseudo-electricity values," So instead of the correct unit "g" "A" (amps) is displayed.

### 3.2 Parameter file: MSB\_Para.txt

The addresses and parameter setting for the VSpeak Vario is made through the file: MSB\_Para.txt. When delivered, the data is according to Section 3.1.1.

E/A	Adresse	Alarm	Alarmwert	
1	7	0	25.0	Vario
1	3	0	9.0	Ges. -Spannung
1	2	1	3.0	Zellen-Spannung
1	6	0	300	Höhe
1	12	0	4.0	X-Beschl.
1	13	0	4.0	Y-Beschl.
1	14	0	4.0	Z-Beschl.
1	4	0	40.0	Temperatur
0	15			Min. Ges. -Spannung
0	15			Min. Zellen-Spannung
0	15			Min. Höhe
0	15			Min. X-Beschl.
0	15			Min. Y-Beschl.
0	15			Min. Z-Beschl.
0	15			Min. Temperatur
0	15			Max. Ges. -Spannung
0	15			Max. Zellen-Spannung
0	15			Max. Höhe
0	15			Max. X-Beschl.
0	15			Max. Y-Beschl.
0	15			Max. Z-Beschl.
0	15			Max. Temperatur

vario-Version: 1.03

Annotations:

- column headings
- parameters (total 22)
  - 8 x current values + alarms
  - 7 x minimums
  - 7 x maximums
  - one line for each sensor value
- version display

To change the configuration a micro SD card has to be inserted in the VSpeak-Vario (A micro SD card is not included, but can be ordered separately on [www.vspeak-modell.de](http://www.vspeak-modell.de)). If there is no "MSB\_Para.txt" file on the card, it will be created with the current configuration. The now created MSB\_Para.txt on the SD card can be edited on the PC (laptop, etc.) with a standard text editor.

### File description: MSB\_Para.txt:

The file contains a table whose **columns and rows must not be interchanged**. The single parameters are separated by at least one space, followed by a comment (sensor value).

Below the columns and their values are described:

**E/A:** 0...NOT activ, i.e. value is **not** transmitted  
1...active, i.e. value is transmitted and displayed

**Adresse:** 2...15 (addresses 0 and 1 are not allowed)

**Alarm:** 0...alarm OFF  
1...alarm ON

### Alarmwert:

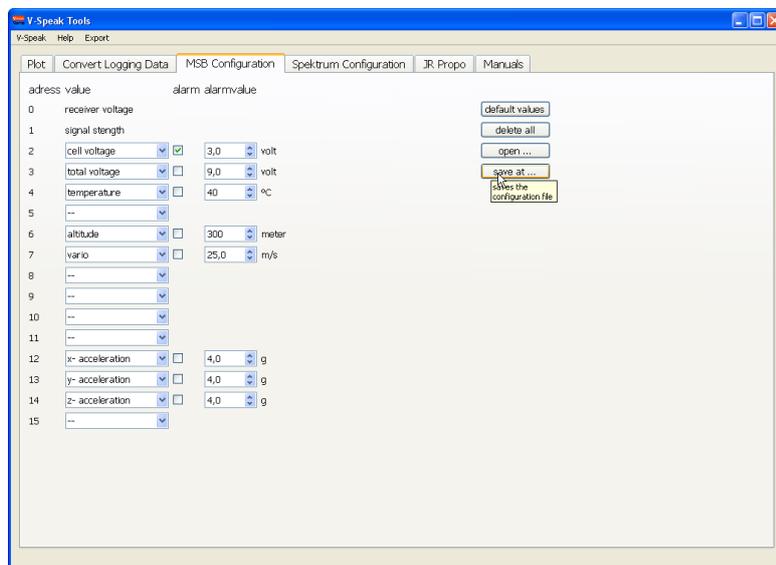
If Alarm=1 then an alarm will sound if the measured value with respect to the alarm value:

- >= value of Vario
- <= total voltage
- <= cell voltage
- >= altitude
- >= value of #-axis
- >= temperature

valid value ranges for VSpeak-Vario alarm values					
(* „pro“ Version)					
alarm value	resolution	min value	max value	class	MSB description
Vario	0.1 m/s	0.0	25.4	3	rising / falling
total voltage	0.1 V	0.0	25.4	1	voltage
cell voltage	0.1 V	0.0	10.0	1	voltage
altitude	10 m	0	990	8	height/short distance
#-axis	0.1 A	0.0	8.0 (24.0*)	2	<b>current</b>
temperature	1 °C	0.0	100.0	6	temperature

According to the resolution are without the altitude to be entered the alarm values with one decimal, separator is the dot (.)

### 3.2.1 Parameter setting via "VSpeak Tools"



While using the PC program "VSpeak tools" comfortable editing the MSB\_Para.txt is possible.

Have a look at [www.VSpeak-modell.de](http://www.VSpeak-modell.de), category downloads. You can get the latest version of "VSpeak-tools.zip" there.

## 4 Logging the data

The Vario can also be used as a logger. This requires just a MicroSD card with FAT or FAT16 format to be inserted into the card holder. With each turning on of the Vario a new file is created. Any existing files are not overwritten. The file name is in the form "VS-V\_000.VLG", with increasing numbers (The Vario has no clock, thus no file creation date is generated).

Some Micro SD cards might not function. A matching SD card can be purchased at [www.VSpeak-modell.de](http://www.VSpeak-modell.de).

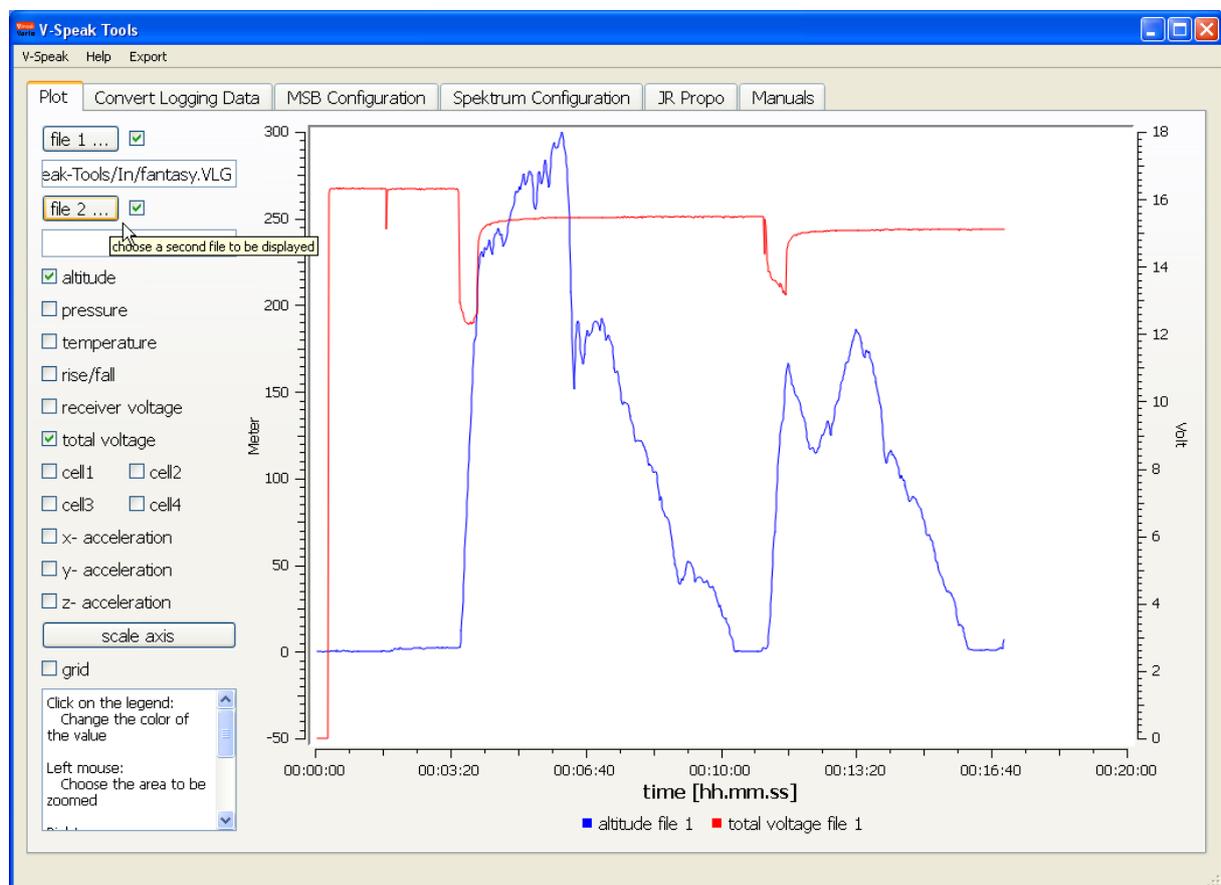
### 4.1 Logging rate

- The default logging rate is set to 1Hz. Every second the values are recorded and stored every 10s to the SD card.
- If there is a file named „LOGRATE5.TXT“ on the SD card, then the logging rate is set to 5Hz, meaning 5 values per second are recorded and stored every 2s to the SD card. The content of the „LOGRATE5.TXT“ does not matter, only the presence of the file is important.

The analysis of the logged data can be done in several ways:

### 4.2 Analysis of data using "VSpeak Tools"

Under [www.VSpeak-modell.de](http://www.VSpeak-modell.de) and downloads can be downloaded the file "VSpeak-tools.zip" and the contained program "VSpeak-Tools.exe" can be started.



Under the tab "Plot" can open the log files directly and the measured values are displayed graphically. The possibility exists, to put the data from two log files "superimposed" and so can easily compare.

### 4.3 Analysis of data using "Logview"

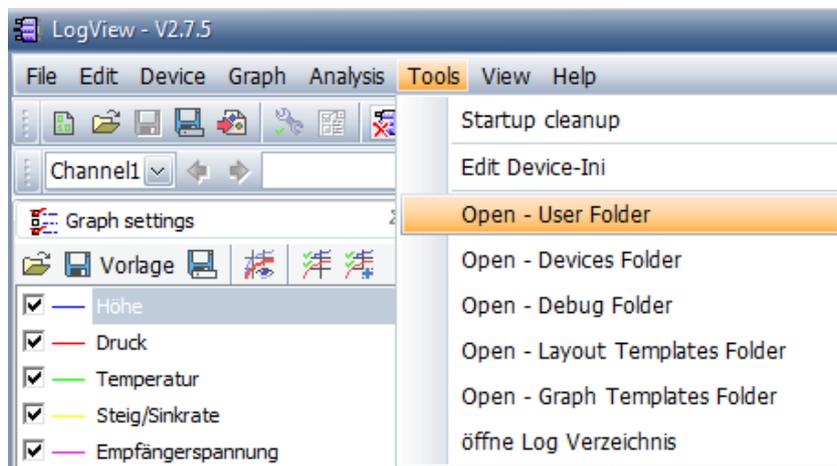
The binary saved log data must be converted using the program "VSpeak-Tools.exe" in csv spreadsheet format. CSV files can be opened by many programs such as Microsoft Excel, Open Office and many other programs. For the program Logview a configuration file is available, so that the data can be presented there in a simple way.

#### 4.3.1 Installation of Logview

If you haven't installed LogView yet you can download the current version at [www.logview.info](http://www.logview.info). Run the installation file and follow the instruction of the program.

#### 4.3.2 Installation of Logview for the VSpeak-Vario

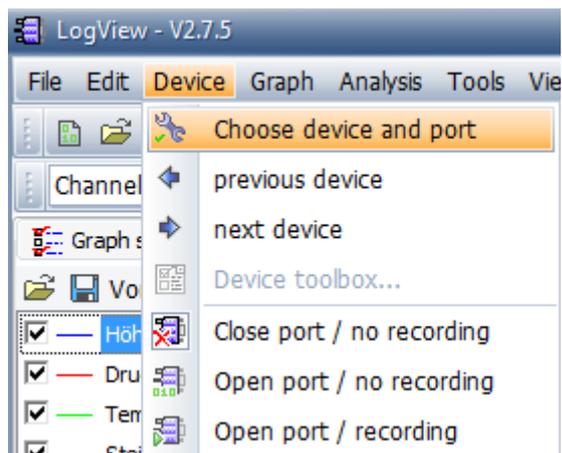
Start Logview. If you have reinstalled Logview you are asked for some settings through which can be skipped with "Next". Go to "Tools" "OPEN - User Folder" in the main menu.



It now opens an Explorer window. Open the sub folder "Devices". Copy the file "Vspeak-Vario.jpg" (provided on the Vspeak Homepage in the file "LogView\_VSpeak.zip") in this folder. Copy the file "Vspeak-Vario.ini" in the subfolder "OpenFormat".



Click in the main menu of Logview on "Device" "Choose device and port".



Select in the tab "Device" the "Openformat\VSpeak-Vario".



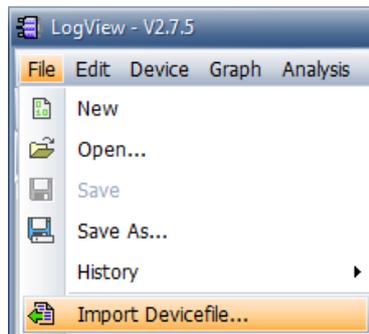
Close the window.

### 4.3.3 Convert the log files

Run the program "VSpeak-Tools.exe". In the program item "Convert Logging Data," select the Input Path to the folder where your \*.VLG files are located. For the outputted format you select the button "Logview". In the Output Path are now the \*.csv data for import into Logview ready (see Section 4.4).

#### 4.3.4 Importing the converted data in Logview

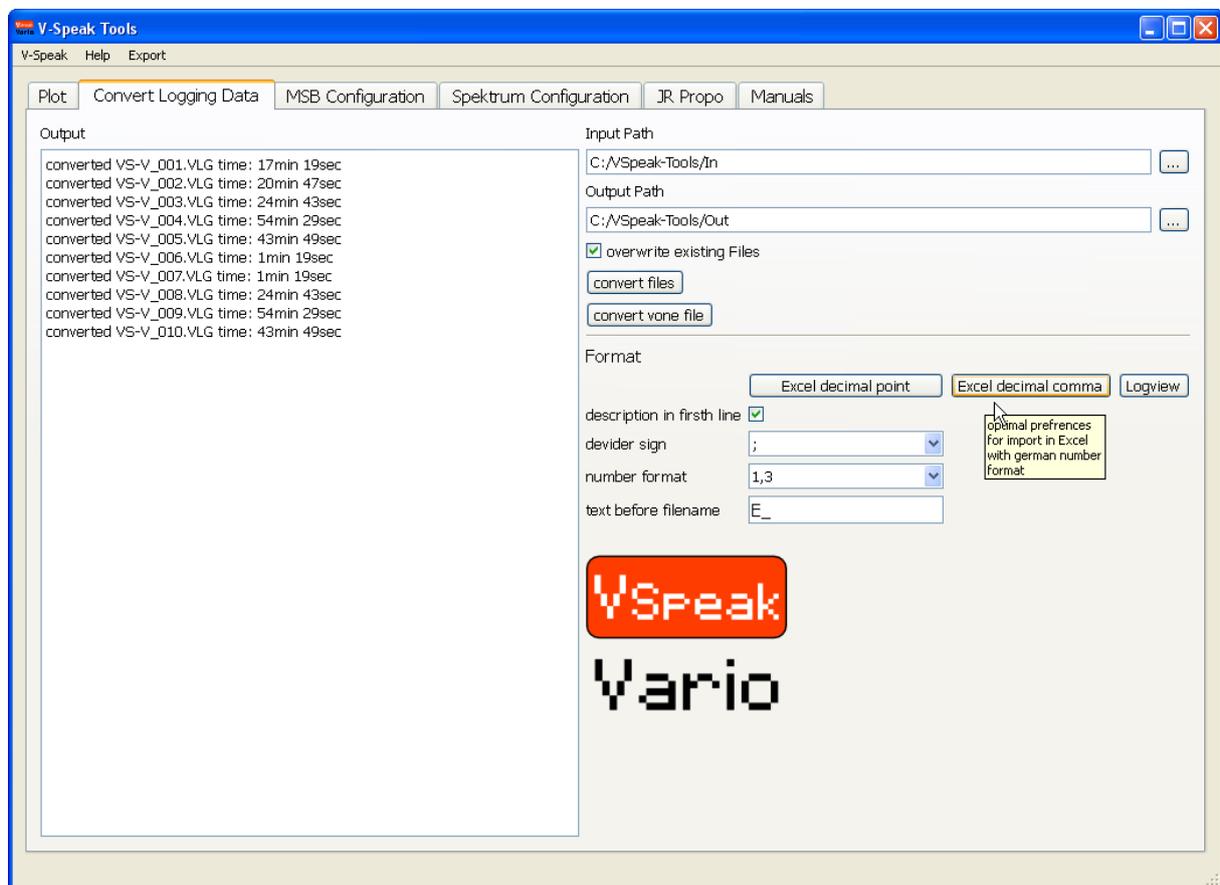
Open Logview and import the desired log file under "File" "Import Devicefile"



Select the CSV file (eg "VS-V\_001.csv")  
The values should now be displayed graphically.

#### 4.4 Analysis of data using other programs

With "VSpeak-Tools / Convert Logging Data" can be converted the \*.VLG data to other formats, e.g. EXCEL, Logview.



## 5 Update

The processor on the VSpeak-Vario contains a SD bootloader with a version counter.

If firmware updates are available they will be sent via mail. The information in the mail files are copied on the Micro SD card (formatted FAT or FAT16), this is inserted into the speech module and power turned on. The boot loader will recognize the new software version, boots (blue LED "flickers") and is now up to date.

## 6 Accessories

A micro SD card is NOT included in the package. For updates only Micro-SD cards with a maximum capacity of 2GB are supported. You can obtain a matching card at [www.vspeak-modell.de](http://www.vspeak-modell.de).

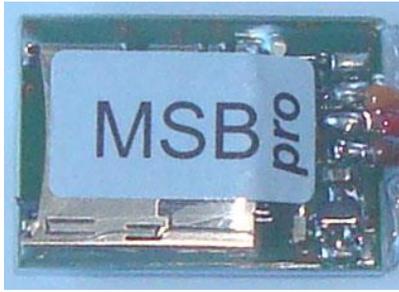
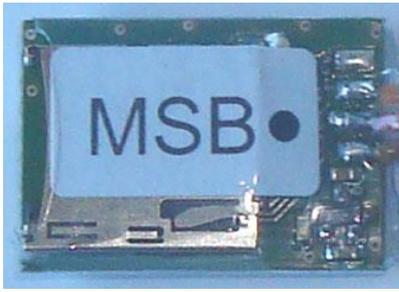
Also NOT included in the package are the on the page [www.vspeak-modell.de/variometer/accessories](http://www.vspeak-modell.de/variometer/accessories) listed balancer adapter cable - these can be ordered separately.

## 7 VSpeak Vario "pro"

Externally, the VSpeak Vario can only be distinguished by the imprint "pro" against the standard design.

For the height measurement, a Swiss precision pressure sensor is used in the pro version. Its properties result in a higher sensitivity and faster response of the Vario tone with less "noise".

In the "pro" version the acceleration measurement range is up to + / -24 g in all three axes.

	VSpeak Vario "pro"	VSpeak Vario (standard)
		
MSB_Para.txt	Vario-pro-Version: 1.01	Vario-Version: 1.01
acceleration	-24.....+24 g	-8.....+8 g

## 8 Technical data

Power supply	3.5 ... max. 9V from receiver (z.B.: 1-2s LiPo)
Power usage	20 mA
Single cell voltage	2 ... 4.5V per cell
Measuring range	receiver voltage: 0....13 V single cell voltage: 0....28 V relative altitude: -1000 ... 8000m acceleration: -8....+8 g or -24...+24 g "pro" temperature: -10....+80°C
Measuring accuracy	receiver voltage: ± 0.1V single cell voltage ± 0.1V relative altitude: ± 2m acceleration: ± 0.1g temperature: ± 0.5°C (in the air pressure sensor)
Resolution	altitude 0,1m
Dimensions	27 x 17 x 5 mm
Weight	5 g
Connections	UNI servo plug input for telemetry connection on the receiver balancer adapter cable for max. 4 cells

## 9 Instructions for disposal



Equipment marked with the symbol should not be disposed of within household waste.

## **10 EG Declaration of Conformity**

*Manufacturer*

VSpeak-Modellbau (Volker Weigt)  
Priestewitz



*We hereby declare that the product*

Vario VSpeak

*complies with the following European directives:*

2004/108/EC    EMC Directive  
2006/95/EC    Low Voltage Directive (LVD)  
2011/65/EC    Restriction of Hazardous Substances (RoHS)

*The presumption of conformity is taken by applying the following harmonized standards:*

EN60065        Audio-, video- and similar electronic apparatus - Safety requirements  
EN60332        Tests on electric and optical fibre cables under fire conditions  
EN60950        Information technology equipment - Safety  
EN61000-6-1    Electromagnetic compatibility (EMC)  
EN61000-6-3  
EN55022        Information technology equipment - Radio disturbance characteristics

Priestewitz, 2012/11/01

.....  
Signature  
Volker Weigt  
Managing Director

## **11 Version history**

<b>Vers.-No</b>	<b>Date</b>	<b>Comment</b>
1.0	11.2012	first retail version
	07.2013	revision Manual (Logging, VSpeak tools)
1.1	09.2013	better signal filtering, correction data transfer MSB Logging rate can be changed from default value 1Hz to 5Hz Logging not limited to 1h 48 min anymore
1.2	12.2013	Sales start VSpeak-Vario "pro" (no change in the standard version)
1.3	08.2014	no changes

## **12 Contact**

Volker Weigt

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