



- Vario (Spektrum)

Manual Version 1.4



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 8).

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 measured values of VSpeak-Vario can be visually displayed on the display's of the Spektrum telemetry transmitter. VSpeak-Vario can be daisy-chained on the X-Bus. In order to prevent address conflicts, you can disable sensor addresses on the VSpeak-Vario.

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 Spektrum, all measurements and alarms of VSpeak-Vario are preferably 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.

Content

Page

1	<u>Installation</u>	3
2	<u>Connection</u>	3
2.1	Operation display	3
3	<u>Live Telemetry</u>	4
3.1	Display: Altitude	4
3.2	Display: Single cell and flight pack voltage	4
3.3	Display: Acceleration X-/Y-/Z-Axis.....	4
3.4	Display: Single cell voltage and temperature	4
3.5	Display: Ascending/descending rate (Vario)	5
4	<u>Parameterization</u>	5
4.1	Address Management.....	5
4.2	Parameter file: SPE_PARA.TXT.....	5
4.2.1	<i>Parameter setting via "VSpeak Tools"</i>	6
5	<u>Logging the data</u>	7
5.1	Logging rate	7
5.2	Analysis of data using "VSpeak Tools"	7
5.3	Analysis of data using "Logview"	8
5.3.1	<i>Installation of Logview</i>	8
5.3.2	<i>Installation of Logview for the VSpeak-Vario</i>	8
5.3.3	<i>Convert the log files</i>	9
5.3.4	<i>Importing the converted data in Logview</i>	10
5.4	Analysis of data using other programs.....	10
6	<u>Update</u>	11
7	<u>Accessories</u>	11
8	<u>VSpeak Vario "pro"</u>	11
9	<u>Technical data</u>	12
10	<u>Instructions for disposal</u>	12
11	<u>EG Declaration of Conformity</u>	13
12	<u>Version history</u>	13
13	<u>Contact</u>	13

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

Connect the 4-pin connector to the X-Bus of the TM1000. It can be used in conjunction with other sensors, too.

Attention ! While using multiple sensors on the X-Bus 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.

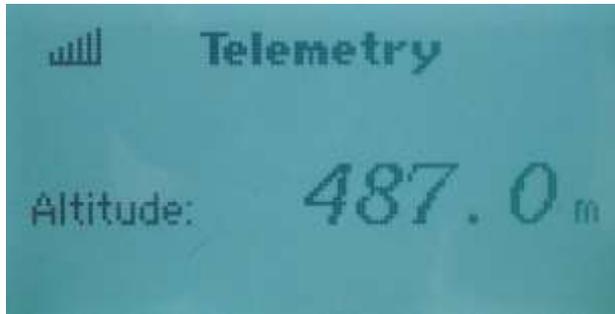


3 Live Telemetry

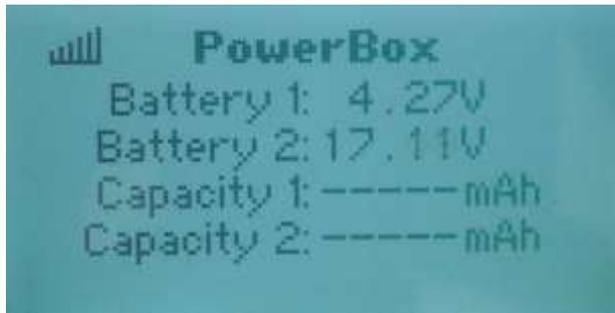
Following the display of telemetry values is illustrated using a DX8.

Other radios like the DX9, DX10t and DX18 show the values similarly.

3.1 Display: Altitude



3.2 Display: Single cell and flight pack voltage



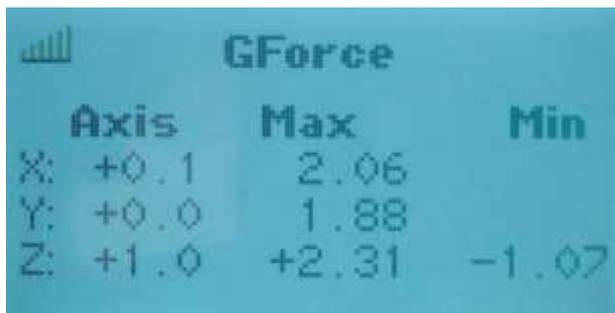
The lowest single cell and whole flight pack voltage is displayed using the "Power Box" sensor screen.

Battery1: lowest cell voltage

Battery2: flight pack voltage

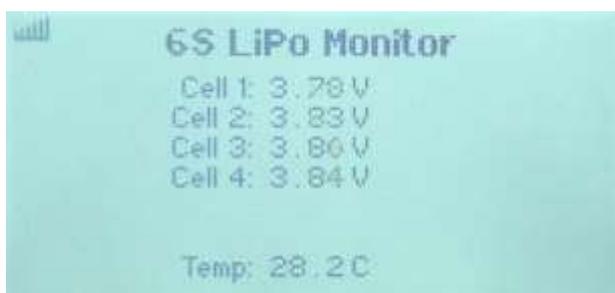
It is possible to set alarms for both voltages.

3.3 Display: Acceleration X-/Y-/Z-Axis



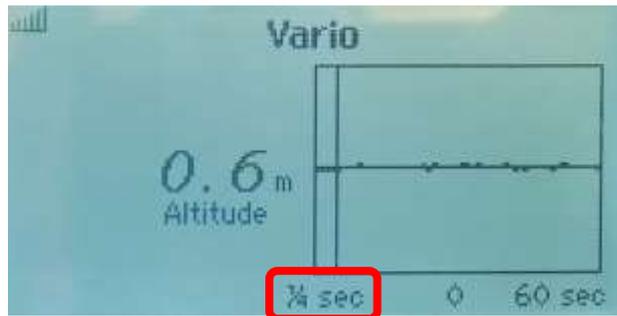
The values of the 3-axis acceleration sensor are displayed here.

3.4 Display: Single cell voltage and temperature



The values of the battery cells and the Vario temperature are displayed here.

3.5 Display: Ascending/descending rate (Vario)



Vario display for example at DX18 (in spectrum radios with integrated vario display the refresh rate must be set to 1/4s).

In spectrum transmitters without vario function, such as DX8, a Vario tone is still possible with the help of VSpeak speech module.

If there is a SD card installed, also the rate of ascend/descend will be logged.

4 Parameterization

4.1 Address Management

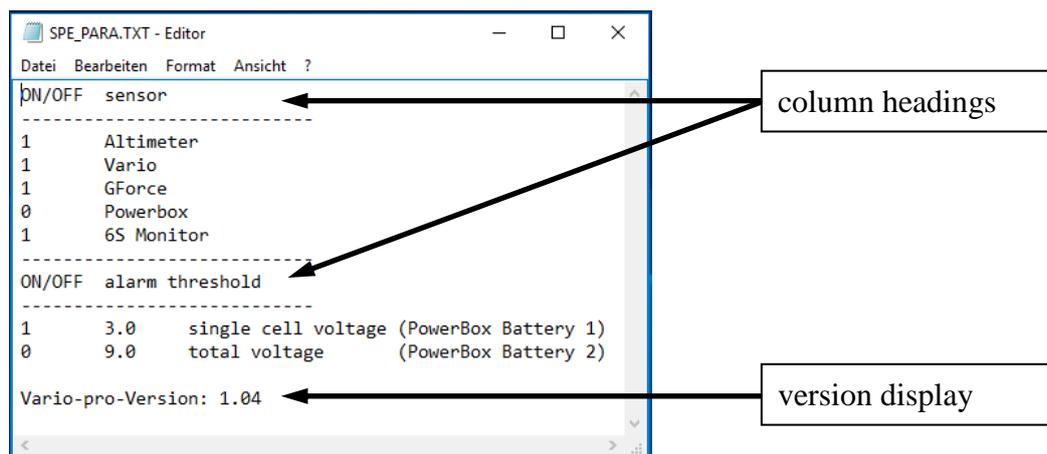
The X-Bus is a bus for multiple different sensors. In order to transfer all the needed data, Vspeak-Vario emulates multiple sensors with different addresses:

- Altimeter
- Vario (Rate of ascend/descend)
- GForce (Acceleration)
- PowerBox (Voltage measurement)
- 6SLiPoMon (cell monitoring and temperature)

If you plan to use any of these sensors in conjunction with Vspeak-Vario, please refer to section 4.2 to disable any of the used addresses.

4.2 Parameter file: SPE_PARA.TXT

The parameter setting for the VSpeak Vario is done with the file: SPE_PARA.TXT. The shipping values are shown below:



The voltage alarms are only available if the corresponding Powerbox alarms are enabled.

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). If there is no "SPE_PARA.TXT" file on the card, it will be created with the current configuration. The now created SPE_PARA.TXT on the SD card can be edited on the PC (laptop, etc.) with a standard text editor.

File description: SPE_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).

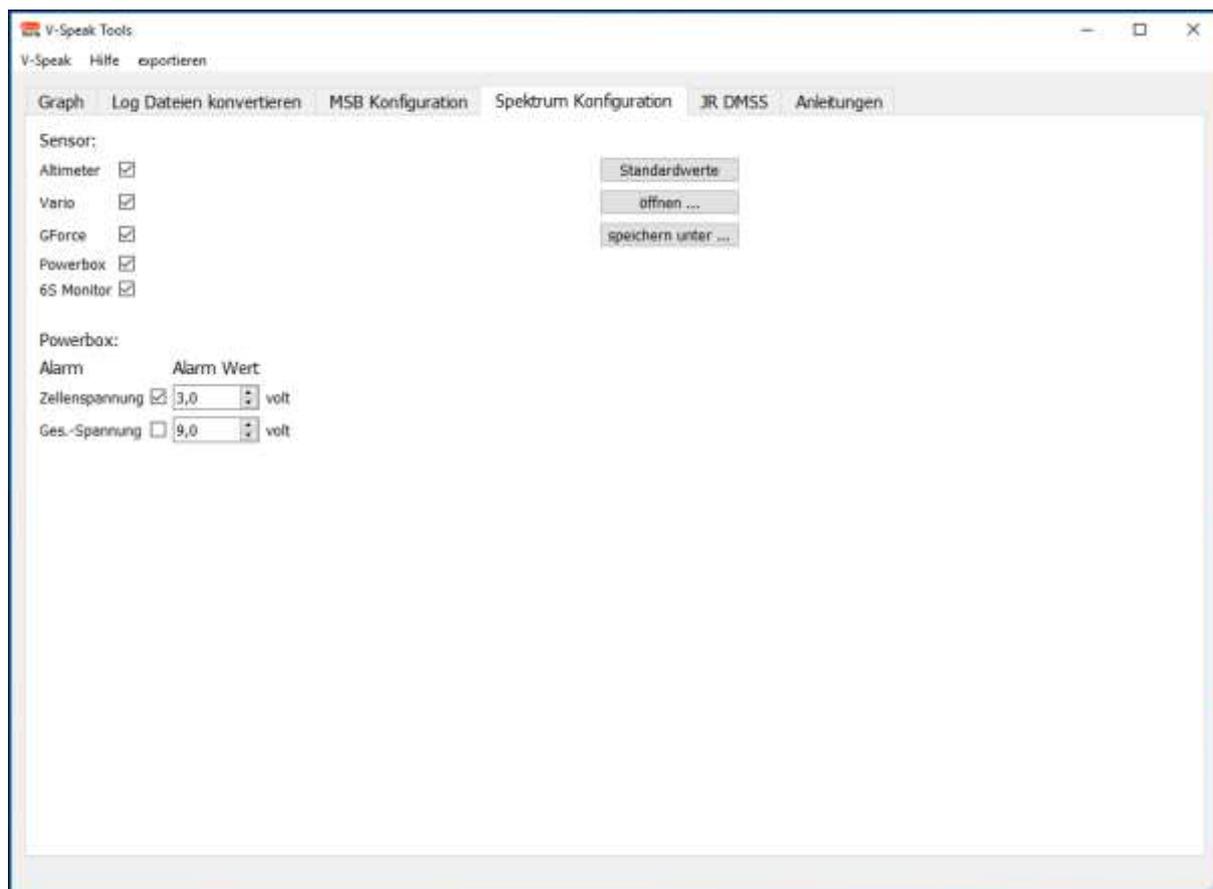
Below the columns and their values are described:

ON/OFF sensor: 0...sensor NOT activ, i.e. value is **not** transmitted
1...sensor active, i.e. value is transmitted and displayed
Notice: The changes take effect after **two** power cycles !

ON/OFF alarm threshold: 0...alarm NOT activ
1...alarm activ, if the voltage is below the threshold, alarm is triggered

valid value ranges for VSpeak-Vario alarm values			
alarm value	resolution	min value	max value
cell voltage	0.1 V	0.0	10.0
total voltage	0.1 V	0.0	25.4

4.2.1 Parameter setting via "VSpeak Tools"



While using the PC program "VSpeak tools" comfortable editing the SPE_PARA.TXT is possible.

Have a look at www.VSpeak-modell.de , category downloads. You can get the latest version of "VSpeak-tools.zip" there.

5 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.

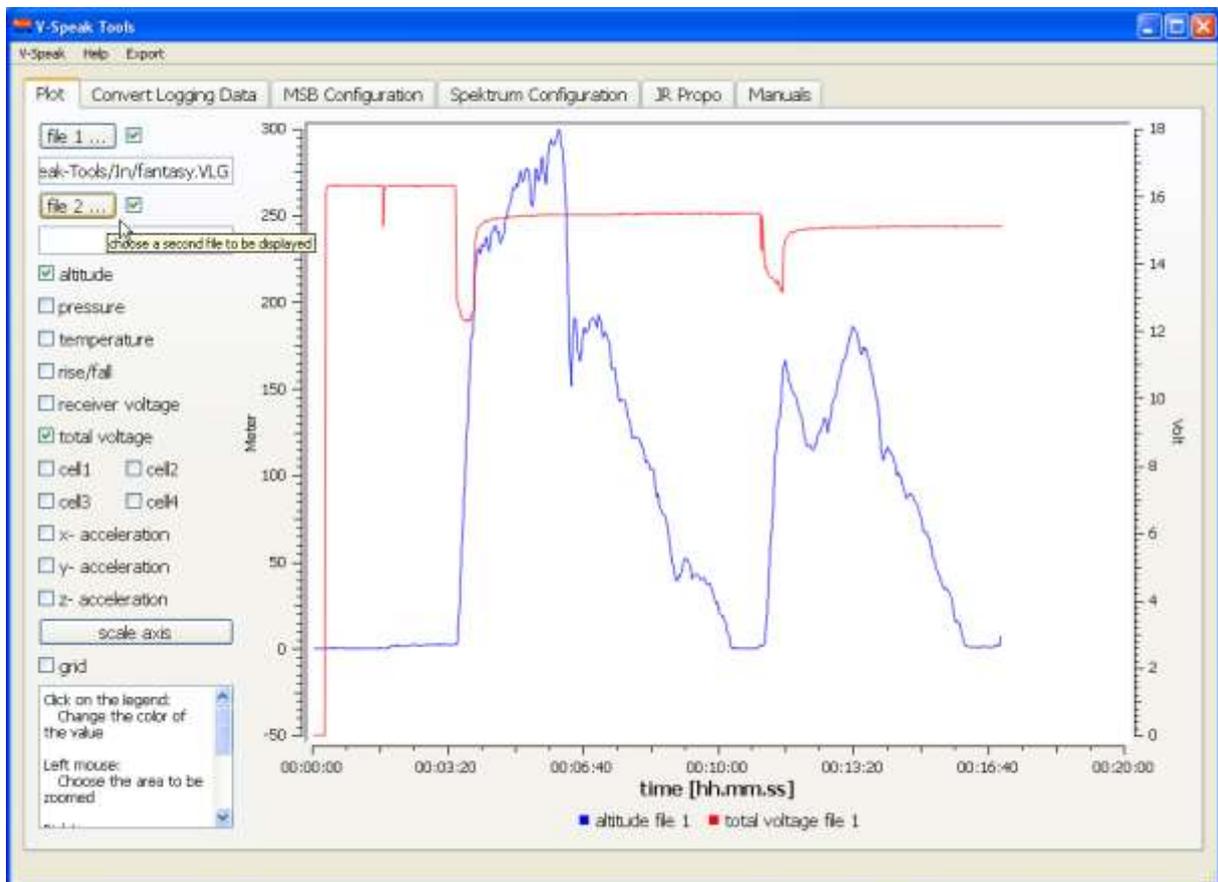
5.1 Logging rate

- 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:

5.2 Analysis of data using "VSpeak Tools"

Under 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.

5.3 Analysis of data using "Logview"

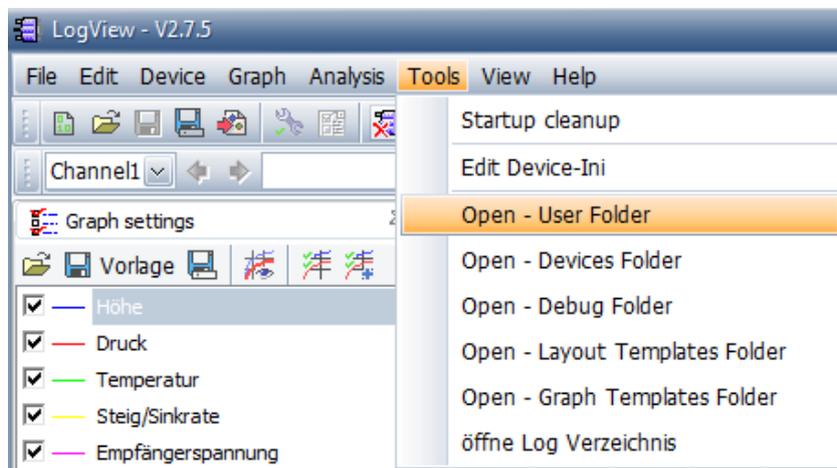
The binary saved log data must be converted using the program "VSpeak-Tools.exe" in csv spreadsheet format. CSV files can be opened by many programs such as Microsoft Excel, Open Office and many other programs. For the program Logview a configuration file is available, so that the data can be presented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

5.3.1 Installation of Logview

If you haven't installed LogView yet you can download the current version at www.logview.info. Run the installation file and follow the instruction of the program.

5.3.2 Installation of Logview for the VSpeak-Vario

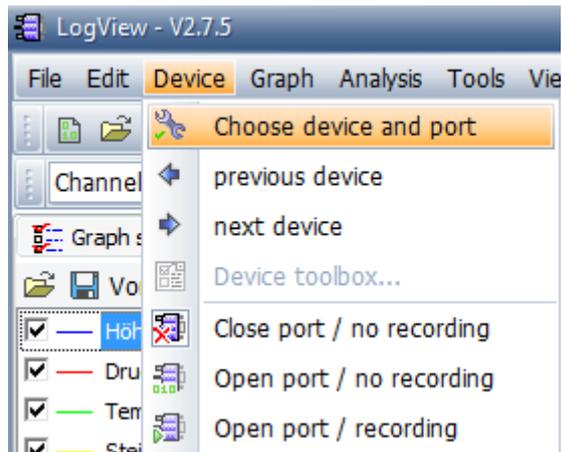
Start Logview. If you have reinstalled Logview you are asked for some settings through which can be skipped with "Next". Go to "Tools" "OPEN - User Folder" in the main menu.



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".



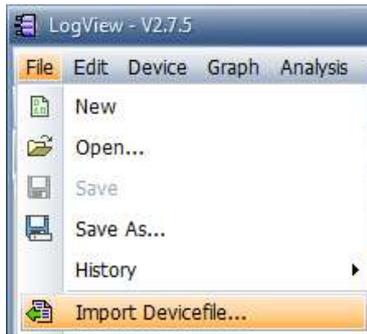
Close the window.

5.3.3 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 5.4).

5.3.4 Importing the converted data in Logview

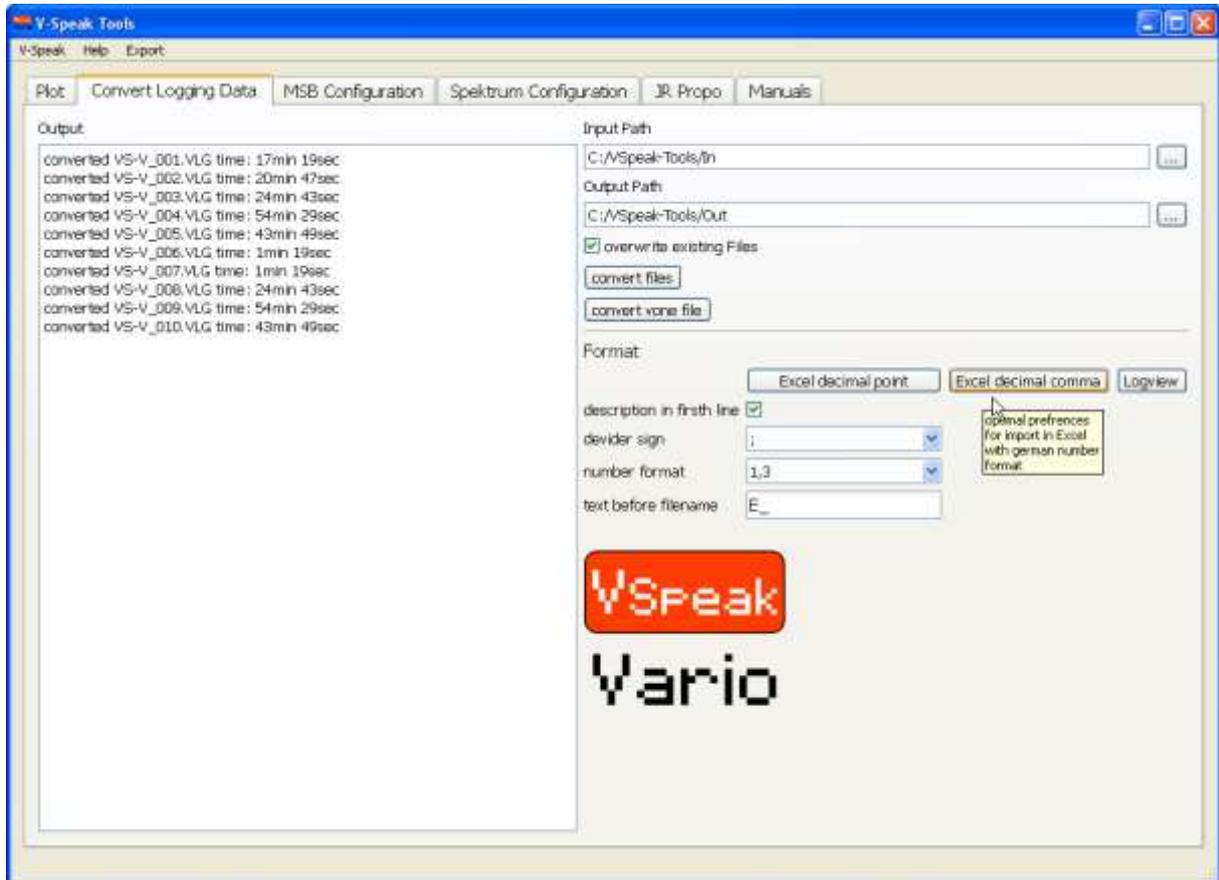
Open Logview and import the desired log file under "File" "Import Devicefile"



Select the CSV file (eg "VS-V_001.csv")
The values should now be displayed graphically.

5.4 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.



6 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.

7 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.

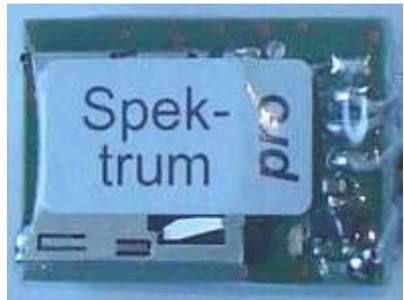
Also NOT included in the package are the on the page <http://www.vspeak-modell.de/en/variometer/accessories> listed balancer adapter cable - these can be ordered separately.

8 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)
		
SPE_Para.txt	Vario-pro-Version: 1.04	Vario-Version: 1.04
acceleration	-24....+24 g	-8....+8 g

9 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 11 mm
Weight	6 g
Connections	4-pin. connector for X-Bus telemetry on TM1000 balancer adapter cable for max. 4 cells

10 Instructions for disposal



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

11 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, 2013/09/01

.....
Signature
Volker Weigt
Managing Director

12 Version history

Vers.-No	Date	Comment
1.1	09.2013	first retail version
1.2	12.2013	Sales start VSpeak-Vario "pro" (no change in the standard version)
1.3	08.2014	no changes
1.4	02.2017	6S LiPo Monitor supported

13 Contact

Volker Weigt

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