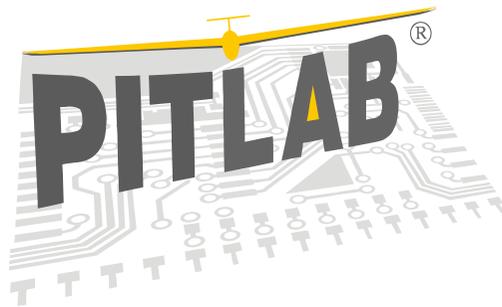


Short Instruction Manual

# SkyAssistant

Variometer - logger for R/C sailplanes



[www.pitlab.eu](http://www.pitlab.eu)

CE 1471



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Dear fellow modeller

Congratulations on choice of the SkyAssistant, the telemetry system of models of gliders. This device was made to help you find and center thermals and improve the technique of glider's start and flight. It gives you a feedback as an acoustic signal of variometer, verbal communicates about altitude, onboard electrical system voltage and detailed recording of the parameters of flights so that you could analyze them carefully at home.

The following instruction is an abstract concerning the most important information about device. Browse it before you start working with the equipment. Full documentation can be found in an electronic form attached to the configuration program of SkyAssistant.

## Variometer

It is a basic function block of SkyAssistant. It indicates vertical component of the speed of a model. Positive speed (rising) is signalized by broken, high tone. The greater lifting the higher and more frequently broken the tone is. Negative speed (descending) is signalized by constant, low tone. The greater descent the lower the tone is. Variometer of SkyAssistant works in similar way to differentiator module processing a signal from pressure sensor.

## Altimeter

It operates on the basis of differences in atmospheric pressure changing along with the altitude. Current altitude during flight may be get known by asking SkyAssistant with the change of PPM channel value, defining the altitude edge above which the communicate about altitude will be spoken or programming cyclic verbal communicates spelled every given period of time.

## Voltage measurement of the model's wiring system

It is used to define state of set that powers model's receiver. Value of voltage is passed to the pilot in a form of verbal communicate started at chosen time, analogically to the communicate of altitude and automatically, at voltage drop every 0.1V.

If the user exceeds predefined level of alarming voltage (default 4.2 V) this communicate is announced every 20 seconds.

## Temperature measurement

It is used to defined the temperature of air or glider's elements such as engine or battery pack. Communicate about the value of temperature can be released analogically to that about altitude. Measurement is performed by external, integrated temperature sensor. Direct contact of the sensor with measured object is recommended. In the case air temperature measurements the sensor should be placed out of the fuselage. While temperature of elements is to be measured and sensor should be attached by an adhesive tape.

## Radio transmitter and receiver

SkyAssistant sends acoustic signals to the pilot by using one channel from the available bands: LPD (433MHz, 69 channels in total), PMR (446MHz, 8 channels in total) or FRS (462, 467MHz 14 channels in total). Particular channels can be chosen with DIP switch.

**Note!** Change of the channel can be done only during initialization of the device, directly after turning the power on. Change of the position while working will be successfully completed after turning the device on again.

Originally in European version, first 32 channels are occupied by even LPD channels (2..64) and all the rest 8 channels by PMR (1..8). In American version first 14 channels are occupied by FRS. List of the switch positions defining channels is printed on the box of SkyAssistant.

Radio signals emitted by the transmitter can be received with standard LPD, PMR (European version) or FRS (American version) receiver.

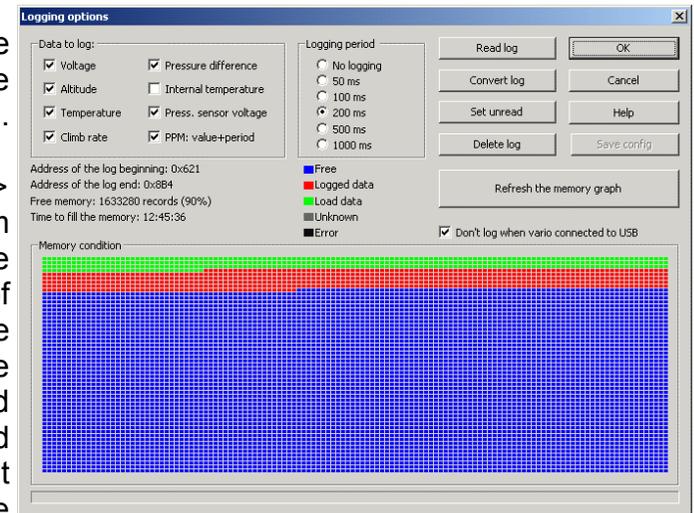
## Verbal communicates generator

It is a set of algorithms transforming numeric value of the parameter into a set of samples, which create communicate if spelled in proper order. It is possible to regulate strength of the voice and pronunciation pace. Moreover, there is a possibility to listen to and chance particular samples as well as the whole (change of a speaker).

## Logger

SkyAssistant is equipped in logger that periodically records the measured parameters in non-volatile memory. Logger activity is signalized by short blinks of red LED. Speed of blinking depends from logging period.

Logger may be configured with the program attached. Choose *Configuration* -> *logger...* from menu. In the window of configuration one may choose the number of logged parameters and time of subsequent recordings to the log.



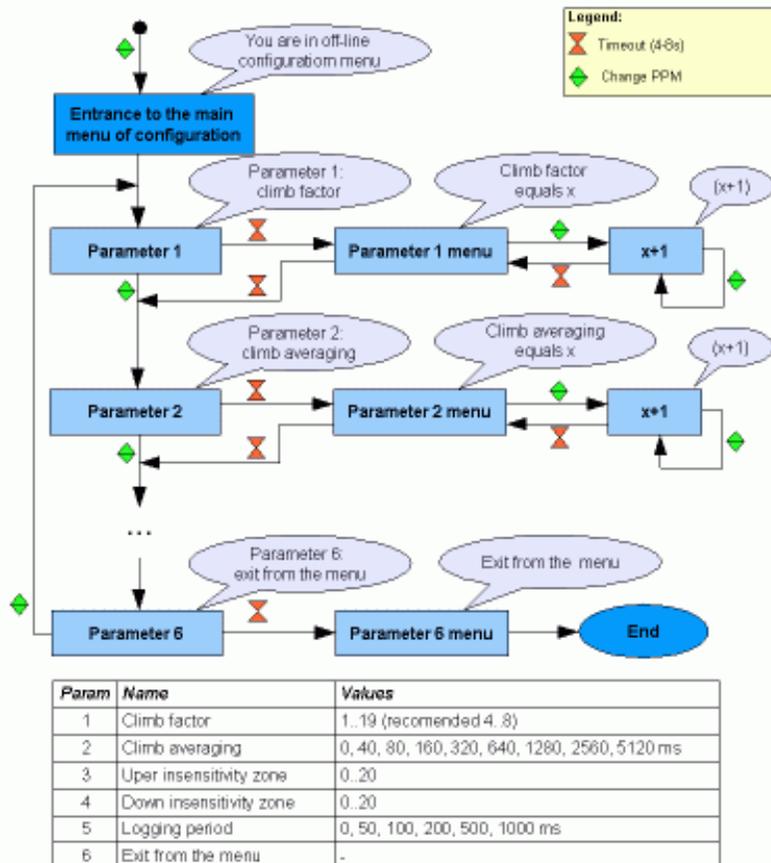
After completed flights one may read the gathered data with the order *Read log* that is located in the window of the program. These data will be recorded to a binary file with **log** extension. In order to facilitate analysis of gathered data, it should to be converted the **log** file to a text file with **vgd** extension. It can be done by pressing the button *Convert log*. Data processed in this way can be easily displayed in a form of graphs in the main window of the program using the menu *File* -> *Open*.

## PPM Signal Analyzer

Is used to measure value of PPM signal and signalizes beginning of the reach end of receiver that appears in more frequent interruptions in PPM signal. Both distances between the impulses and their width are measured. If a given number of errors occurs during one second (constructively 5 errors/second), it is signalized by a high tone repeated for a few times. Parameters of the alert (tone, number and time of impulses) can by defined individually.

## Off-line parameters configurator

In order to enable changes of main parameters during your stay at the airport Sky Assistant has been equipped in configuration procedure that is operated by changes of PPM channel value and verbal communicates. Entrance to the configuration is realized by a change of PPM channel value of at least 50% during initialization time. In a main menu of the configuration one may modify value of 5 parameters. Change of PPM channel value causes moving on to the next parameter and lack of changes in a given period of time causes entrance to the procedure of modification of this parameter. While entering parameter modification menu the change of PPM signal causes incrementation of parameter's value and no reaction means exit and acceptance of the value.



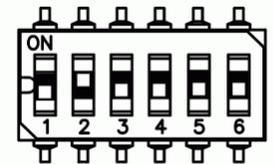
## Connection of the variometer

SkyAssistant is ready to work after being connected to any channel of RC receiver or just to the power source of 3.5 - 12V. However, in the other case, it is impossible to poll values of parameters measured via PPM channel.

During configuration and logs reading it should be connected to the USB connector of a computer. Power is supplied both by the receiver's connector and USB. Both sources of power are separate and can be plugged in at the same time. Measurement of supply voltage is carried only out at receiver's input that is why the measurement of supply voltage value of USB is equal 0V. Communication via USB is signaled by green LED.

## First start

Before turning the power supply on, check if channel and band of the transmitter and receiver are set in the same way. Initially, the transmitter is positioned on the channel 6 of LPD band as shown in the picture.



After turning SkyAssistant on it reports communicate about current status and starts initialization lasting 30 seconds. It emits short, single squeaks every 3 seconds during this time and completes the process with the communicate 'initialization finished'. During initialization altitude indication is being reset and we are waiting for settling of work conditions of the variometer's differentiator module.

Installation in a model

General rules of SkyAssistant installation in a model are similar as in the case of RC receiver. It is recommended to:

- lead possibly straight aerial out,
- place in a fuselage possibly far from sources of strong interruptions like engine or regulator and far from the receiver,
- use elastic binding protecting from vibrations,
- perform range check of RC transmitter.

## Installation of the program

At first the following USB driver should be installed: *CDM\_Setup.exe*. Then, copy the content of the *software* folder to the destination on your computer's disk. Now you can connect SkyAssistant with delivered cable to the USB connector of your computer. Serial port driver should be automatically detected and installed. From now on, you may start the *vario.exe* program and begin configuration of the device.

On the CD there is a set of software in the version current for the moment of production. With development of the device newer versions of particular components of the software will appear on the forum.

## Technical support

The forum was established for the purposes of effective exchange of information. It is available here: <http://www.pitlab.pl/forum>

New versions of software and firmware will be published there along with answers for your questions. You may direct any suggestions concerning development of the device there. One may boast of his recorded flights as well.

## CE declaration of conformity

SkyAssistant produced by the Pit Lab company located at Jana Olbrachta Street 58a/164 in Warsaw, stays in agreement with 1999/5/WE directive of the European Parliament and Council from March 9, 1999 and 2002/96/WE directive from January 27, 2003.

## Used equipment procedure

According to the 2002/96/WE directive concerning waste electrical and electronic equipment (WEEE) the following electrical product must not be removed as unsorted municipal waste. We ask you to remove this product by giving it back to the place of purchase or passing to the local, municipal waste sorting station that accepts wastes for recycling.

## Technical specification

Climb sensitivity: about 5 cm/sec  
Altitude resolution: 1 m  
Altitude range:  $\pm 3000$  m  
Temperature range:  $-20 +100$  °C  
Dimensions:  $70 \times 26 \times 11$  mm  
Weight: 20 g  
Power supply: 3.5 - 12 V  
Power consumption at 4.8 V: 50 mA

## Warranty

The producer makes a great effort to make work with SkyAssistant comfortable and deprived of faults. He obliged himself to remove any technical faults that would occur as a result of production errors or defects in material free of charge within 14 work-days since the date of delivery to the service point. The warranty covers two years since the date of sale. The warranty concern only the equipment and does not cover software. All the devices destined to repair, both with valid and expired warranty, should be sent to address of the producer:

Pit Lab, Piotr Laskowski  
ul. Jana Olbrachta 58a/164  
01-111 Warszawa, Poland

The warranty does not cover mechanical damages or faults that occurred as a result of the use that does not stay in agreement with the instruction. Any self modifications that has not been discussed with the producer are forbidden. If you are not sure if an unusual use of the device may cause damages, please use the technical support.

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Date of sale      Serial number



Seller's seal