

Short Instruction Manual

SkyAssistant

Variometer - logger for R/C sailplanes



www.pitlab.com

€ 1471!



Warsaw 2010

Dear fellow modeller

Congratulations on your purchase of the SkyAssistant telemetry variometer for RC model gliders. This device has been designed to help you find and centre thermals and improve your thermaling technique and safety. It gives immediate acoustic tonal feedback of lift and sink, with verbal announcements of altitude, onboard electrical system voltage, and temperature. It also includes a logger that records a detailed recording of the measured parameters during your flights, so that you can analyze them carefully at home.

The following is a condensed manual containing the most important information about the SkyAssistant and its PC software. Please read it before you start working with the equipment. Full documentation can be found in an electronic form attached to the configuration program of your SkyAssistant.

Variometer

This is the main function of the SkyAssistant. It indicates vertical component of the speed of a model. Positive speed (lift) is indicated by broken, high tone. Like a full size glider's variometer, the audio tone increases in frequency and modulation with increasing model upward velocity. Sink (vertical descent) is signalled by a constant, low tone. The greater descent the lower the tone is. The SkyAssistant variometer works in similar way to a differentiator module, it processes the signal from the pressure sensor and outputs the rate of change of altitude.

Altimeter

The model's altitude is calculated from the current atmospheric pressure. The altimeter function announces the height of the model in the language and units selected. The announcement can be commanded from the transmitter using a spare R/C channel, and/or it can be programmed to occur on crossing height boundaries or at regular time intervals.

Voltage Announcement

The R/C voltage into the variometer is measured and announced. The

voltage is announced every time it drops by 0.1V, and an alarm is announced if the voltage drops below the alarm trigger voltage (default 4.2V). This alarm is repeated every 20 seconds.

Temperature measurement

The system has a temperature sensor that can measure the temperature of the ambient air, or of any hardware it is thermally attached to. This can be used to monitor the temperature of a motor, speed controller, or battery pack. The sensor can be attached using adhesive tape. Thermal contact can be improved using the heat conductive paste used to attach PC CPUs to their heat sink.

Radio transmitter and receiver

The SkyAssistant transmits 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). The particular channel required must be selected with the DIP switch.

Note! After changing the channel using the DIP switch the vario must be powered down and up again (rebooted), for the new channel to take effect.

In the 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. A list of the switch positions defining channels is printed on the box of SkyAssistant.

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

Verbal Communication Generator

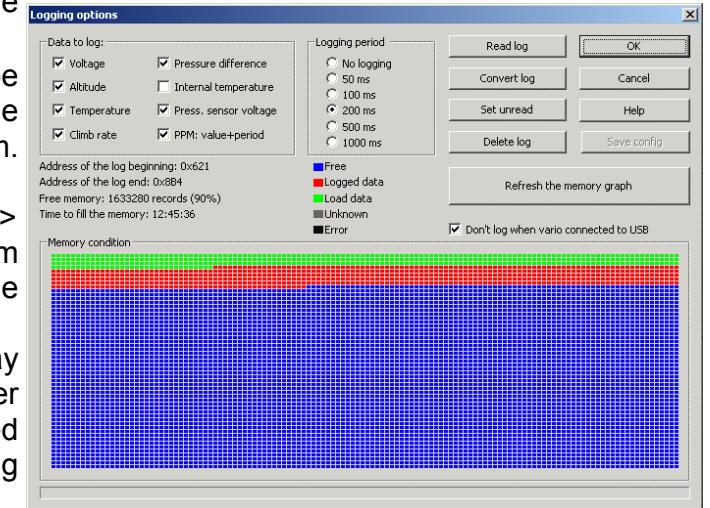
This transforms the numeric value of the parameter into audio sounds, which will sound like a human spoken voice when sequenced correctly. Using the configuration software it is possible to regulate the strength and pace of the voice. It is also possible to upload new voice files, to change the speaker and even language.

Logger

The SkyAssistant is equipped with a logger that periodically records the measured parameters in non-volatile memory. Logger activity is indicated by short blinks of the red LED. The speed of blinking depends on the logging rate.

The logger may be configured with the supplied program.

Choose *Configuration -> logger...* from menu. In the configuration window one may choose the number of logged parameters logging rate.



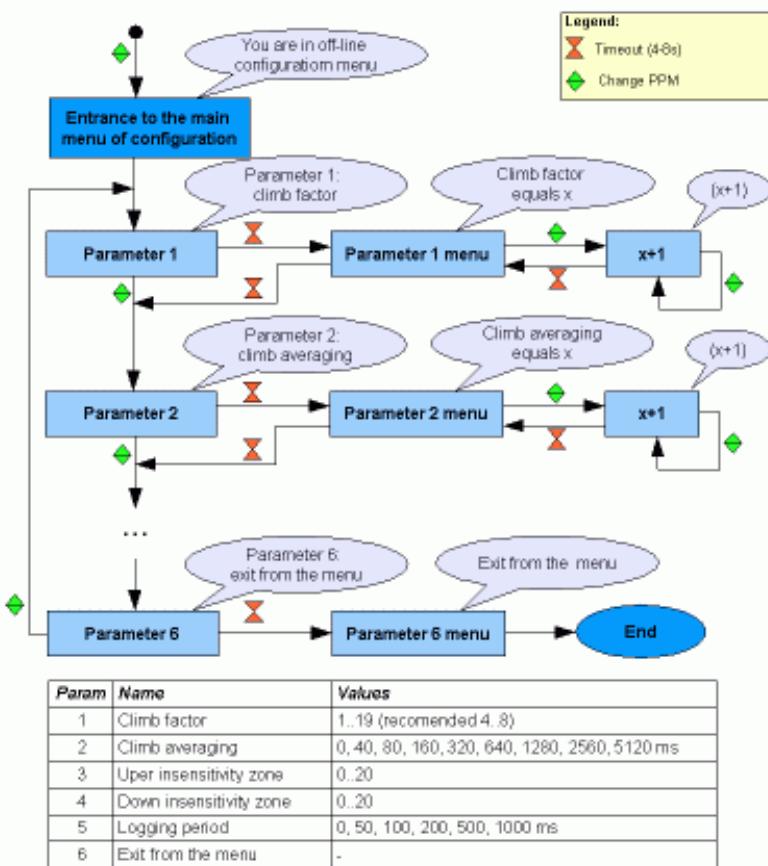
After flying one may read the logged data with the order *Read log*. This data will be recorded to a binary file with **log** extension. In order to facilitate analysis of gathered data, it should be converted the **log** file to a text file with **vgd** extension. It can be done by pressing the button *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

This is used to measure the value of the PPM signal from the receiver. Both the pulse rate and width are measured. If a given number of errors occurs during one second (usually 5 errors/second), it is indicated by a repeated high tone alarm. The parameters of the alert (tone, number and time of impulses) can be defined individually.

Off-line parameters configurator

In order to enable changes of main the parameters on the flying field the SkyAssistant can be configured from the transmitter. Configuration is started by the pilot commanding a large stick movement (a change of PPM channel value of at least 50%) while the variometer is initialising itself. In a main menu of the configuration one may modify the value of five parameters. A 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 the parameter's value to increment and no reaction means exit and acceptance of the value.



Connection of the variometer

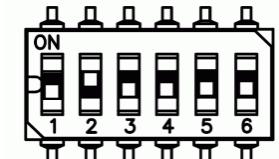
The SkyAssistant is ready to work after being connected to any channel of RC receiver or just to the power source of 3.5 - 13V. If not connected to a spare receiver channel it is impossible to monitor the R/C signal, or accept commands from the pilot.

When connected to a PC using the USB port the variometer can be configured, and the logs read, using the supplied software. Power can be supplied both by the receiver's connector and/or 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 indicated by a 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 about its current status and starts an initialization lasting 30 seconds. It emits short, single squeaks every 3 seconds during this time and completes the process with the announcement 'initialization finished'. During initialization altitude indication is reset

Installation in a Model

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

- lead the aerial directly out, keeping it straight if possible,
- place in a fuselage possibly far from sources of strong emissions or blanketing like an engine or battery and far from the receiver,
- use rubber mounts to protect from vibrations,
- perform a RC range check to confirm good safe operation.

Installation and update of the Program

First the USB driver should be installed by clicking on *CDM20600.exe*. Then, install SkyAssistant software clicking on *setup.exe*. Software will be installed into *ProgramFiles/SkyAssistant* directory.

Now you can connect SkyAssistant with the supplied mini USB cable. The PC should automatically detect the new hardware and install the serial port driver. You can now double click on the SkyAssistant icon on your desktop and begin configuration of your variometer.

The supplied flashdrive will contain up to date software, at the time of production. The software has build in feature of automatic update. It is initially enabled and checks server once a day for presence of the new version. Most of the software components can be upgraded automatically. Firmware files are downloaded to the */fw* directory and asked about manual update.

Technical support

The <http://www.pitlab.pl/forum> forum was established for effective exchange of information and customer support. 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 is produced by the Pit Lab company located at Jana Olbrachta Street 58a/164 in Warsaw, and conforms 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 SkyAssistant should not be discarded in general waste facilities, but should be returned to the supplier or placed in an appropriate municipal sorting station that accepts wastes for recycling.

Technical specification

Climb sensitivity: about 5 cm/sec

Altitude resolution: 1 m

Altitude range: 3000 m

Temperature range: -20 +100 °C

Dimensions: 70 × 26 × 11 mm

Weight: 20 g

Power supply: 3.5 - 13 V

Power consumption at 4.8 V: 50 mA

Warranty

The manufacturer makes a great effort to ensure the SkyAssistant is supplied working and free of faults. We guarantee that technical faults found as a result of production errors or defects in material will be corrected free of charge with a target turn around time of 14 work-days from the date of return to the service point. We warranty the SkyAssistant for two years from the date of sale. The warranty covers only the equipment and does not cover software. All the devices destined for repair, both with valid and expired warranty, should be sent to direct to:

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

The warranty does not cover mechanical damage or faults that occurred due to crash damage or as a result of not following our instructions. Any unapproved modifications are forbidden. If you are not sure if an unusual use of the device may cause damage, please use the technical support.

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Date of sale

Serial number



Seller's seal