

# FLYMASTER

# VARiO



VARiO User manual  
Document version 2.0

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**Warning**

It is the sole responsibility of the pilot to operate the aircraft in a safe manner, maintain full surveillance of all flying conditions at all times, and not become distracted by the Flymaster VARIO. Flymaster Avionics is not responsible for any damages resulting from incorrect or no data provided by the Flymaster VARIO. Flight safety is the sole responsibility of the pilot.

It is unsafe to operate the Flymaster VARIO while in the air. Failure by the pilot equipped with a Flymaster VARIO to pay full attention to the aircraft and flying conditions while flying could result in accident with property damage and/or personal injury.

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## 1 Introduction

Thank you for choosing FLYMASTER VARIO. If you have any questions or comments regarding the use of our equipment you can visit our website or contact our Support Department ([support@flymaster-avionics.com](mailto:support@flymaster-avionics.com)).

This manual covers Firmware versions up to 1.01v If you have a more recent version of firmware some of the features may not be covered.

## 2 Overview



Figure 1 - VARIO Overview

## 3 Getting started

Fully charge battery before using FLYMASTER VARIO for the first time.



**Figure. 2 - USB Connector**

The battery may be charged by either connecting the VARIO USB connector to the wall socket charger or USB cable. USB connector can be found on the right side of the VARIO (see Figure. 2).

### 3.1 Charging the Battery

Flymaster VARIO has a completely new battery power management, that gives the pilot a more accurate information about the battery state, as well as the charging time and battery remaining time.

To charge the Flymaster VARIO battery you can use the wall charger, the Usb cable, or the car charger. Flymaster accessories are recommended in order to avoid damage the power management module.

Charging, or battery status information is shown in the Shutdown menu.

When not being charged, the remaining battery level is shown as a percentage. In addition the estimated remaining working time (TTG) is shown. Both values are estimated based on the average consumption of the device since the last charge. Naturally, any change in consumption profile results in an estimation error.

The Flymaster VARIO has 2 charging modes, namely, “Quick Charge” and “Slow charge”. The charging mode choice is made automatic.

Quick charge mode is only choose when the wall charger, or the car charger are used, while Slow Charge mode is choose when is used a USB cable connected to a Pc.

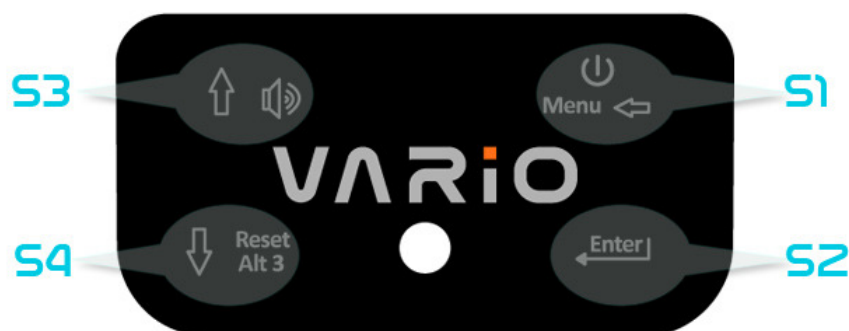
**Note: Charging is not possible when the device is turned on, and the device is connected to a PC. In order to start charging the device should be turned off.**

Information about the charging process can be seen in the shutdown page, or in the center of the display when the device is turned off. In both cases information displayed includes: the charging mode, slow or quick; the current battery level in percentage; and the remaining charging time in hh:mm format.

**Note: Charging should be avoided at high temperatures in order to reduce the probability of battery overheating.**

## 3.2 VARIO Keys

Four keys are used to interact with VARIO (see Figure. 3). In this manual we will call MENU key to S1, ENTER key to S2, UP key to S3, and DOWN key to S4. Each key has 2 functions depending on whether the device is in *flight mode* or in *menu mode*. Additionally the MENU key is used to “power-up” the VARIO when it is switched off.



**Figure. 3: Keys**

In *Flight Mode* each key has a specific functions, which is indicated by a symbol draw in the key. The symbol are self explanatory, so key S4 allows resetting Altimeter 3, S1 change to menu Mode, S2 switch the layout page, and S3 to change the volume. The volume can also be changed trough the Menu (see section 6.4.5 )

## 3.3 Using keys Inside Menu

Changing parameters on the VARIO can be performed through the menu. Changing a parameter involves accessing the menu, selecting an option, and then changing a specific field value.

Accessing the main menu can be done by pressing the MENU key in flight mode. Once in

the menu, UP, and DOWN keys can be used to scroll up, and down, through the menu options list. Once the desired option is selected, the option is highlighted, and the ENTER key should be used to access the option. Depending on the menu option, either appears a new menu options list, or a data fields list appears. Going back from a menu can be achieved using the MENU key.

When accessing data fields the associated menu option becomes “grayed” and the respective field data item is highlighted. Using the UP, and DOWN, keys changes the value on each field. When the correct value appears pushing the ENTER key moves to the next field, or in some cases to the next character/digit. Conversely, pushing MENU key moves to the previous field, or to the next character/digit.

If the ENTER key is pushed on the last field all the data in the selection section is stored and control returns to the configuration menu. Inversely, if the MENU key is pushed on the first data field the changed settings are ignored and control is returned to the configuration menu.

When setting a data field that involves setting several characters, e.g. when defining a waypoint name, after defining the desired characters, then pushing the ENTER key continually for more than 2 seconds will make the cursor jump to the next data field, or return to the configuration menu if no more data field needs to be set.

### 3.4 Switching VARIO On and Off

To switch on the VARIO, briefly push the S1 key (*Menu Key*). This will display the start up screen with a 10 second countdown . Pushing the S2 (*Enter key*) before the 10 seconds have elapsed will power up the VARIO. VARIO initiates in flight mode. If the S2 key is not pushed within 10 seconds the VARIO will go back to sleep.

To switch off the VARIO, push the S1(menu key) to activate menu mode, using the arrow keys (S3 or S4) scroll the cursor to the “Shutdown” item and push the S2(Enter Key).

### 3.5 Resetting the VARIO

The reset procedure allows the pilot to restart the VARIO if it freezes, or stop responding. To reset the VARIO just push S1 (Menu key) and the S4 (Down arrow key)



keys simultaneously for at least two seconds.

## 4 Flight Mode

The Flymaster VARIO has two main working modes, namely Flight mode, and Menu mode. Flight mode is used during flight, and this allows the user to see information such as Altitude, or Vario. The VARIO has up to 16 different pages (see Figure. 4) in memory. Each page corresponds to a different screen, which can be completely configured by the user. **A set of 16 pages is called a Layout.** Once a Layout containing multiple pages has been defined, the user can switch page using the S2 Key(ENTER) in Flight Mode.

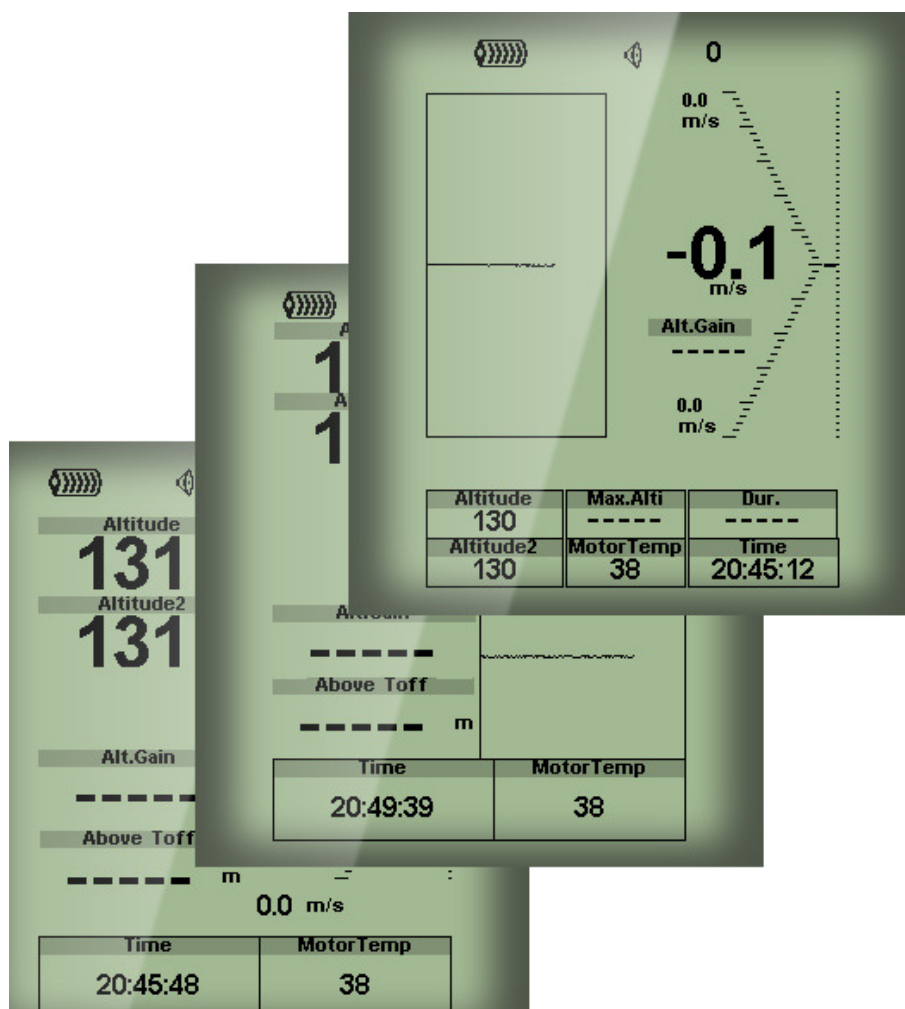


Figure. 4 - Layout pages examples

Screen layout can be configured by the user using a free application, called “*Flymaster Designer*” which can be downloaded from the Flymaster website ([www.flymaster.net](http://www.flymaster.net)). This intuitive tool allows the user to create an unlimited number of layouts, which can be saved to the computer, uploaded to the instrument, and even shared with other Flymaster users.

See the Designer user manual, available on the website for more information about the Designer tool.

Designing a Layout consists of inserting a set of objects, called *Elements*, in the desired position, and with the desired dimensions, in each of the available 16 pages. The Designer works by “what you see is what you get”. This means that when you insert a element in a page, and after uploading the layout to the instrument, you will see exactly the same thing on the VARIO screen.

There are several elements available for the VARIO which are presented in the following section.

## 5 VARIO Elements

The main objective of an element is to provide information to the user. Elements can be Graphical, or Data Field type. Each element have its own properties which can be changed in order to alter the element behavior, and/or shape.

### 5.1 Graphical Elements







Graphical elements are characterized by providing information in a graphical way. Most of the graphical elements have fixed dimensions, although their position can be altered.

As the VARIO firmware evolves the list of Graphical Elements will likely grow. The current version includes the following graphical elements.

#### 5.1.1 Battery

The Battery Element provides a graphical indication of the current battery level. In Table 1 it is possible to see the relationship between what is shown and the actual battery level in percentage. This element has fixed dimensions.








**Table 1 - Battery Element description**

<i>Symbol</i>	<i>Description</i>
	•Battery level above 90%
	•Battery level between 70% and 89%
	•Battery level between 50% and 69%
	•Battery level between 30% and 49%
	•Battery level between 15% and 29%
	•Less than 15% battery remaining

### 5.1.2 Sound

The Sound Element provides graphical representation on the current volume level. Table 2 Shows the relationship between what is shown and the sound level. This element has fixed dimensions.

**Table 2 - Sound Element description**

<i>Symbol</i>	<i>Description</i>
	•Sound Level 6 (maximum sound level)
	•Sound Level 5
	•Sound Level 4
	•Sound Level 3
	•Sound Level 2
	•Sound Level 1
	•Sound is muted (No sound)

### 5.1.3 Analog Vario

The Analog Vario Element shows information regarding the analogue instantaneous vertical speed. This element can be resized and re-positioned.

This Element graphically represents the rate of climb, scaled from 0 m/s to +/-10 m/s depending if you are climbing or sinking.



**Figure. 5 - Analog Vario Element**

When the VARIO detects that the pilot is climbing, a black bar starts to grow on the left, from the bottom of the scale to the top, with 0,1 m/s increments. The same bar grows on the right, from the top of the scale to the bottom, if sinking is detected.

### 5.1.4 Big Analog Vario

The big analog Vario element shows the instantaneous vertical speed like the one in the previews section. This element can be resized and re-positioned.



**Figure. 6 - Analog Big Vario Element**

This Element graphically represents the rate of climb, scaled from 0 m/s to +/-10 m/s depending if you are climbing or sinking.

In this Element a black bar starts from the middle of the scale and grows at 0,1 m/s increments, up to 5 m/s at the top of the scale. When 5 m/s value is reached the black bar starts to disappear from 0 m/s (middle of the scale) until the top of the scale. When the bar completely disappears the climbing rate is equal, or above 10 m/s.

The same process occurs when descending, but from the middle of the scale to the bottom.

### 5.1.5 Altitude graph

The Altitude graph element (see Figure. 7) corresponds to a graph altitude versus time. Altitude is shown in the vertical axis graduated in meters with time shown on the horizontal axis graduated in seconds.

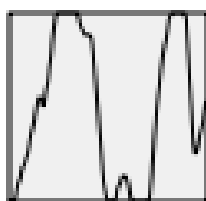
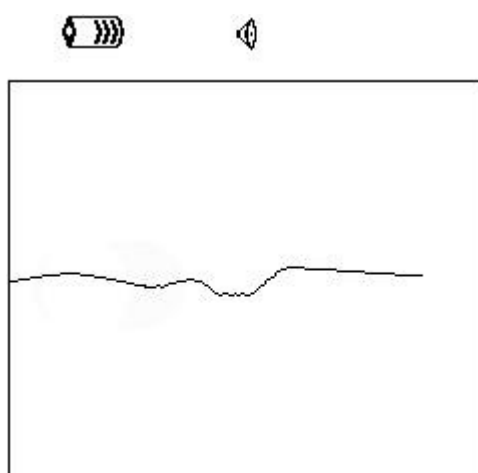


Figure. 7 Altitude graph element

The range of the horizontal axis is fixed and corresponds to 240 seconds (4 minutes), while the range of the vertical axis is automatically adjusted in order to accommodate the gained height. In reality the altitude graph element is a plot of the absolute altitude over the last 4 minutes of flight (see Figure. 8).



Altitude	Max.Alti	Dur.
460	618	00:06:41
Altitude2	Alt.Gain	Time
460	-----	17:23:23

Figure. 8 Altitude plot

## 5.2 Data field Elements

Data field elements can be used to shown numerical information like altitude, time, amongst others. These elements have configurable size, and position, although the text within has only 3 possible sizes. Table 3 explains the available data fields. As the VARIO firmware evolves this list will likely grow.

**Table 3 - Data fields Description**

<i>Field ID</i>	<i>Description</i>
Abs. Pressure	Absolute atmospheric pressure value in Pascals.
Above Toff	Altitude above takeoff is the altitude over the flight starting point.
Alt. Gain	Altitude Gain. Altitude gained in current thermal (see Note 1).
Altitude	Current altitude. This altitude is calculated based on the barometric pressure, and depends on the QNH value (see Note 2).
Altitude2	Second Altimeter which can be set independently to the main altimeter.
Ave.Vario	Average Vario calculated using an integration time constant in order to indicate smoother climbing rates.
Date	Current date.
Dur.	Flight Duration. Duration of the current flight.
Flight Level	Current altitude in hundreds of feet.
Fuel Level	Fuel level in liters (available when connected with Flymaster M1).
Max.Alti	Maximum altitude reached during current flight. This is based on barometric altitude.
Max.Climb	Once a flight has started, it shows the maximum rate of climb encountered during the flight. This value uses the integrated vario not the instantaneous rate of climb. This provides good indication of the quality of the day's thermals. This value is reset when the instrument is switched off.
Max.Sink	Once a flight has started shows the maximum sink encountered during the flight. Note that these values are using the integrated vario. When the instrument is switched off this value is reset back to zero.
Motor Temp.	Motor Temperature (available when connected with Flymaster M1).
Page	Current layout active page number.

Number	
RPM	Motor rotation (available when connected with Flymaster M1).
Time	Current Time.
Vario	Numeric value of the instantaneous Vario (shown in vario graph).
Voltage	Current battery level in Volts

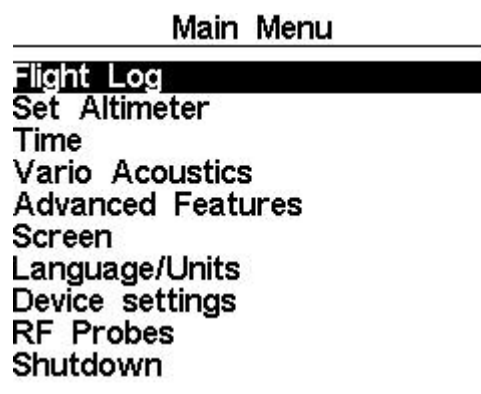
**Note 1-** The VARIO considers a thermal has been entered when the *integrated vario* value is above 0.5m/s and considers the thermal as been exited when the *integrated vario* goes bellow -1.0 m/s. Once in the thermal the Gain indicator will keep track of the maximum altitude reached in the thermal. If the altitude is less than the the max thermal altitude then a negative number will show the difference from the highest point reached. If the altitude is equal or higher than the maximum reached then a positive number will show the altitude gained since entering the thermal. The Gain indicator keeps track of how much altitude is being gained in the thermal. When a pilot enters a thermal the VARIO will reset the Gain indicator to 0 and will start to track how much altitude the pilot has gained. At a certain point in the thermal the lift may become weaker and inconsistent. At this point the gain indicator will show altitude loss in this inconsistency. Once the pilot climbs in the thermal again the indicator will show the gain since entering the thermal.

**Note 2-** The “altitude” field (see Figure 6) indicates the absolute height in meters or feet depending on the setting. This altitude corresponds to the barometric altitude and thus depends totally on the QNH (absolute pressure at a given moment and location in regards to the correspondent pressure at MSL).

The altimeter cannot be reset, but can be set using the corresponding menu option (see section 6.2 ).

## 6 Menu mode

When in *flight mode*, pushing the **menu (S1)** button accesses the *menu mode*. When in *menu mode* pushing the **menu(S1)** button will go back to *flight mode*.



**Figure. 9 - Main Menu Screen**

To access the different items on the menu you can use the UP(**S3**) and DOWN(**S4**) keys. Once a menu item is selected pushing the ENTER (**S2**) executes the selected function.

The main menu screen can be seen in Figure. 9.

## 6.1 Flight Log

The Flight Log option allows the user to access information about previous saved flights. In the top of the screen a list of flights is showed. Each flight is identified by the take off date ,time and flight duration.

Flights can be selected using UP and DOWN keys. For each flight the flowing information is displayed:

- Max. Altitude – Maximum altitude during flight (ASL).
- T.off Alti. - Take off altitude.
- Min. Sink – Maximal sinking rate
- Max Climb – Maximal climbing rate



---

Flight Log		
2012-02-27	15:51:53	00:17:11
2012-02-16	11:28:52	00:26:15
2012-02-14	16:31:23	00:11:11
2012-01-17	16:44:11	00:11:55

---

Max.Alti: 1744m  
T.off Alti: 1320m  
Above Toff: 424m  
Min.Sink: 3.1m/s  
Max.Climb: 2.0m/s

Figure. 10 - Flight Log

## 6.2 Set Altimeter

The “*Set Altimeter*” page allows the user to adjust the barometric altimeters. The VARIO has two altimeters. A barometric altimeter calculates altitude based on atmospheric pressure. Since atmospheric pressure can vary substantially with meteorological conditions it should be calibrated prior to takeoff.

Calibrating the main altimeter can be achieved by entering the known altitude of the location. Changing altitude of the main altimeter automatically calculates the QNH. Conversely, if the QNH is changed then the value of the main altimeter is adjusted accordingly. This method allows calibrating the altimeter by either entering a known altitude at the current location, or known QNH for a particular instant in time at the current location.

---

QNH: 1013.250  
Altimeter: 130m  
Altitude2: 130m

Figure. 11 - Set Altimeter

Altimeter 2 is dependent of the main altimeter, and also QNH. However, changing the altimeter 2 does not change the main altimeter, neither the QNH.

## 6.3 Time

The “*Time*” page allows the user to set the time, and date. (see Figure. 12)

---


Date: 2012 - 03 - 20  
Time: 21:19:55

**Figure. 12 - Timing Parameters**

## 6.4 Vario Acoustics

The user can change the climbing, and sinking rate sound through the respective threshold values. These thresholds correspond to the climbing and sinking rates at which the sound activates.

---

Sink TH: -2.0m/s  
Climb TH: 0.1m/s  
Sink Alarm: 0.0m/s  
Base: 700hz  
Increments: 10hz  
Volume: 

**Figure. 13 - Vario Acoustics**

The user can also define in the Acoustic Thresholds option the sink alarm and the sound volume. (see Figure. 13).

### 6.4.1 Sinking/Climbing Threshold

The sinking threshold is set to -2 m/s by default. The value can be changed by pressing the ENTER key when the “*Acoustic Thresholds*” option is highlighted on the settings menu. This action will highlight the “*Sink TH*” threshold which can be changed using UP and DOWN keys, respectively to increase and decrease the value. Confirmation should be made by pressing the ENTER key, which at the same time highlights the “*Climb TH*” threshold. The same procedure can then be used to adjust the climbing threshold.

### 6.4.2 Sink Alarm

The “*Sink Alarm*” is highlighted when the confirmation of “*Climb TH*” is made. The “*Sink Alarm*” defines a vertical speed value at which a sound (alarm) starts to be produced. This alarm can be used to identify high vertical speeds, as for example, in a spiral dive. Set the Sink Alarm to 0 to disable the alarm.

### 6.4.3 Base Frequency

Additionally the audio frequencies can be adjusted to match the user's preference, by setting the “*Base Frq*” and “*Increments*”.

The “*Base Frq*” is the first frequency used to produce the initial sound which corresponds to the climb threshold, usually 0.1 m/s. Later, as the climb rate increases, a bip, bip sound is produced for which the cadence, and frequency, also increase. The “*Base Frq*” can be set from 500 to 1500 Hz. The higher is the frequency value, the more high pitched the sound is.

In order to change the base frequency value press the ENTER key after the “*Audio Frequencies*” menu option is highlighted. This action will highlight the “*Base Frq*” value so it can be increased using the UP key, or decreased using the DOWN key. The ENTER key should then be pressed, thus confirming the “*Base Frq*” setting. The preset value for “*Base Frq*” is 700 Hz.

### 6.4.4 Increments

The “*Increments*” parameter sets the frequency increment for each 0.1 m/s climb rate increase. The “*increments*” can be set from 1 to 99 Hz. The preset value for “*Increments*” is 10 Hz.

Considering an “*Increments*” value of 10, and “*Base Frq*” of 700 Hz, the vario frequency at 1 m/s is 800 Hz.

### 6.4.5 Volume

The final option allows the user to adjust the sound volume. The current volume level can be seen using the sound element (see chapter 5.1.2 for more details).

The Vario has six different sound levels, plus “no sound”. Pressing UP, or DOWN, key will respective increase, or decrease the sound level. After setting the sound value , to confirm and return to Settings menu press the ENTER key.

**Note that sound volume can also be adjusted using one FS key. However, changing the volume using the S3 key is only valid for the current flight, and will not override the volume level setting.**

**Every time the instrument is turned on, if the sound is muted, a alarm is generated in order to notify the pilot.**

## 6.5 Advanced Features

The advanced features settings option can be used to set further the vario acoustics, and also the integration time constant for the integrated vario.

---

Damper: 6  
Cadence: 1  
Dynamic freq: On  
Buzzer: 3  
Auto Silent: Off

**Figure. 14- Advanced Features**

Using advanced features menu the user can turn the vario sound more or less responsive, and can also turn on, and off, the buzzer functionality.

There are five advanced features:

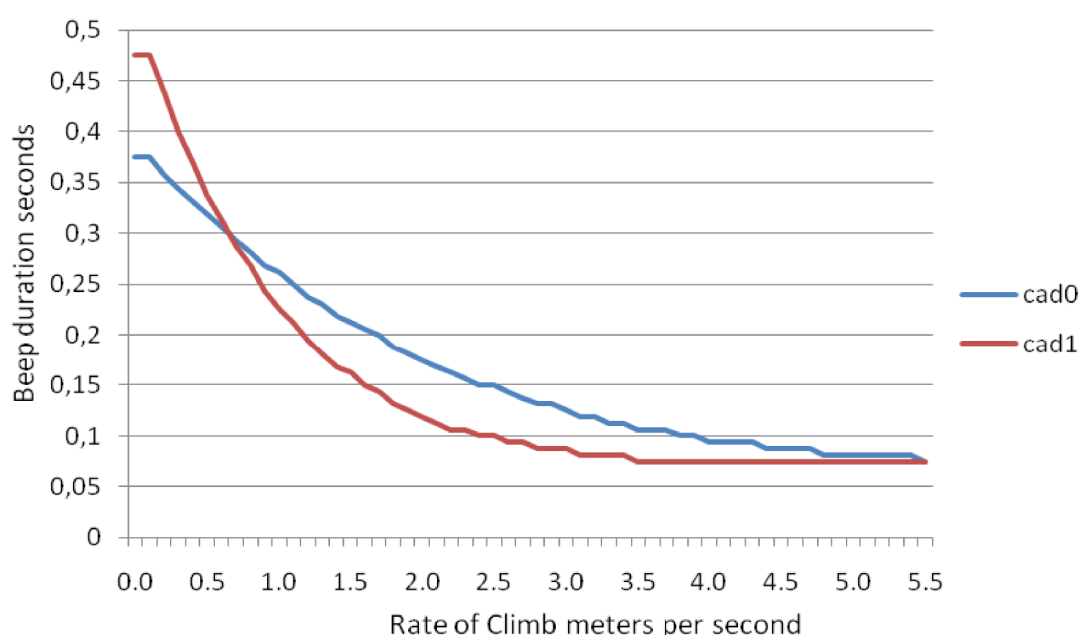
### 6.5.1 Damper

The VARIO's vertical speed calculation is based on air pressure variations. It is very seldom to have air pressure absolutely stable. Turbulence caused by air moving near the sensor is sufficient to cause small variations in pressure. For this reason the VARIO filters (averages) the pressure data to prevent constantly detecting tiny pressure variations. The value that defines how must the pressure is filtered is the “*Damper*”. Setting a lower damper value caused the VARIO to become more responsive but harsher. Inversely a

higher value causes the VARIO to be less responsive but smoother. We have found that an ideal value is 8 and therefore the default value.

### 6.5.2 Cadence

When a rate of climb is higher than that specified by the Climb threshold the VARIO creates a beeping sound. The rate (cadence) of the beeps increases as the climb rate increases. This increase in rate is not linear. The cadence parameter specifies which cadence curve should be used. Current there are 2 possibilities represented in the graph of Figure. 15.



**Figure. 15- Cadence Curves**

### 6.5.3 Dynamic Frequency

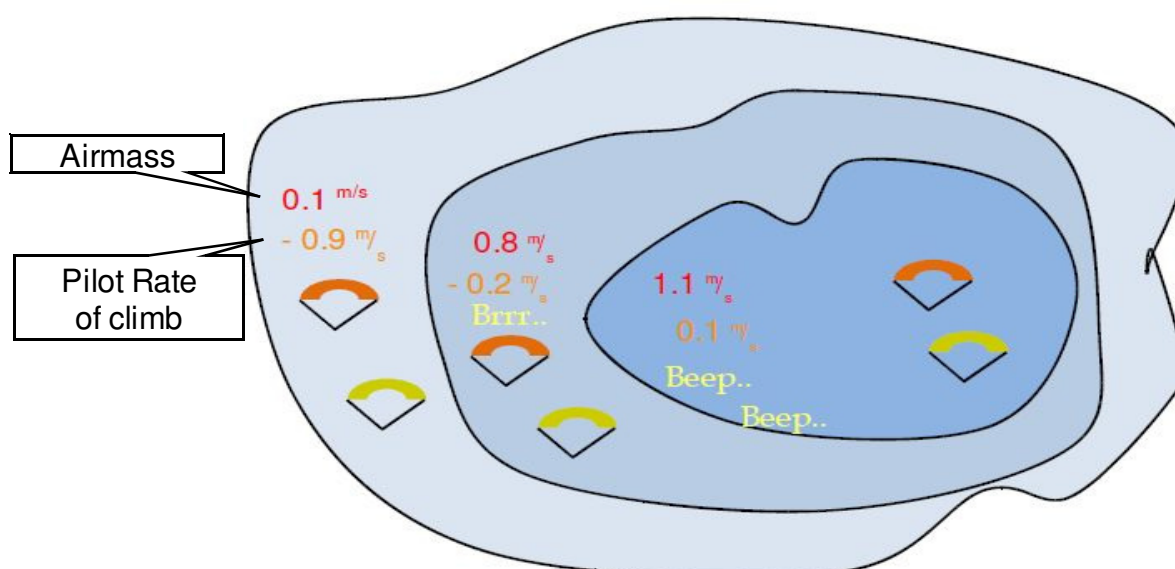
The VARIO beeps at a specified pitch(frequency) when a certain rate of climb is encountered. When dynamic frequency is off the pitch(frequency) of that beep will remain constant if the rate of climb changes. With dynamic frequency on the pitch of the beep may vary if the rate of climb varies during the individual beep.

### 6.5.4 Buzzer

Is so called because of the sound it emits, which resembles a buzzing sound.

The buzzer sound is produced when the rate of climb is close to, but has not yet reached the specified Climb threshold. This value is set between 0 and 9 with each unit corresponding to be 0.1 m/s, ie. 3 is 0.3m/s. Subtracting this decimal value from the climb threshold will give us the value at which the VARIO will start buzzing. For example with the VARIO default values, Climb threshold=0.1m/s, and Buzzer=3 (0.3m/s) the buzzing will start at -0.2m/s because  $0.1 - 0.3 = -0.2$ . Also, at the 0.1m/s directly below the Climb threshold the VARIO will emit a constant sound varying rapidly in pitch from around 100hz to the set base frequency at which the first beep is emitted. Setting the Buzzer value to 0 will disable the buzzer feature.

Although the Buzzer will sound very annoying on the ground it becomes an amazing companion in flight allowing the pilot to pick-up thermals he would have usually missed.



**Figure. 16- Buzzer illustration**

A practical example of the advantages of the buzzer feature can be illustrated in Figure. 16. In this example both pilots are sinking at -1.0 m/s. The orange paraglider has a VARIO for which the climbing threshold is set to 0.1 m/s and the Buzzer parameter is set to 3 (0.3 m/s). The green paraglider has usual vario for which the climbing threshold is set to 0.1 m/s.

As shown in the figure, when both pilots enter the thermal nothing is heard. The air is rising at 0.1 m/s but both pilots are descending at -0.9 m/s. In the second zone of the thermal the air is rising at 0.8 m/s, and so pilots are descending at -0.2 m/s. At this stage the orange pilot starts to hear the Next to Climb brrrrr sound of his VARIO, which helps him to center the thermal, while the green pilot is still unaware of the thermal. Finally, in the 3 zone, the air is rising at 1.2 m/s, and so both pilots climb at 0.2 m/s. The VARIO pilot starts

to hear his vario beep... beep... sound, it is only at this point the green pilot hears the first beep from his instrument.

The green pilot may have missed the thermal completely had he found the inner zone or if he was not watching his friend with the VARIO.

### 6.5.5 Auto Silent

Setting Auto silent on will keep the VARIO's buzzer quiet until a "start flight" has been detected. A start flight is detected when the instruments detects a altitude variation of 5 m.

The audio will then be kept active until the VARIO is switched off. The default value for the auto silent parameter is "On".

### 6.5.6 Integration

The Integrated vario is calculated by integrating the vertical speed during a period of X seconds defined by this value. In the example of Figure. 14 the integration period is 10 seconds (default value).

## 6.6 Screen

The screen menu option allows the user to set the screen contrast. Contrast may be adjusted to the pilot's needs. Beware of adjusting a very low value may cause the display to be totally blank. With a blank screen it is difficult to readjust since nothing is visible.

You can use the UP, and DOWN keys, to move the contrast bar (see Figure. 17). Move the bar to the right to increase the contrast, and to the left to decrease the contrast. When in the desired position push the ENTER key to confirm the value.



**Figure. 17- Screen**

## 6.7 Language/Units

The “*Language and Units*” menu option allows the user to change the VARIO interface language and units. A short description of the available options for this menu are shown in Table 4.

---

Language: English  
 Alti.Units: Meters  
 Roc.Units: m/s

**Figure. 18 - Language/Units**

You can use the UP, and DOWN keys, to change each field option. Pushing the ENTER key confirms the current field value, and highlights the following field. Pushing, the MENU key will undo changes.

**Table 4 - Language/Units Menu Options**

<i>Function</i>	<i>Description</i>
Language	Allows to define the interface language.
Alti. Units	Altitude Units. Altitude can be show in Meters, or Feets.
Roc. Units	Rate of Climb Units. ROC can be show in m/s, or 100xFeets/s

## 6.8 Device Settings

This menu option allows the user to reset all parameters to the default factory values.

**Care should be taken because all changes made by the user are lost.**

In order to reset all settings use UP, or DOWN key to change the “Factory Settings” parameter to “Yes”, and then confirm the action with the ENTER key.



Additionally this menu also allows to make an hardware reset to the instrument. The result is the same as the one presented in section 3.5 . In order to reset the instrument use UP, or DOWN key to change the “Reset Now” parameter to “Yes”, and then confirm the action with the ENTER key.

## 6.9 RF Probes

The “*RF Probes*” menu option allows the user to set the ID of the M1, (motor instrument), and Pitot probe (Wind Speed). The ID is important to distinguish between different external instruments/probes in a scenario were several pilots are near one of each other.

The ID corresponds to the last four digits of the serial number of the probe you wish to connect.

For example consider the M1 with the serial number S/N 1034 00024. In this case the M1 ID should be set to 0024 (see Figure. 19)

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M1 id: 0024  
Pitot id: 0000

**Figure. 19 - RF probes ID setting**

## 7 Firmware

Flymaster follows a policy of continuous improvement of its products. This means that a new version of firmware can be uploaded from our website periodically. The update process is simple.

Before beginning update procedure make sure you download the next files from the download page of VARIO product section:

- USB Drivers according the operating system(Windows, windows 7 64bits or MAC OS X)
- The last version of the firmware(VarioFirmware.fmf)

- The firmware updating software according the operating system (Flymaster firmware installer).

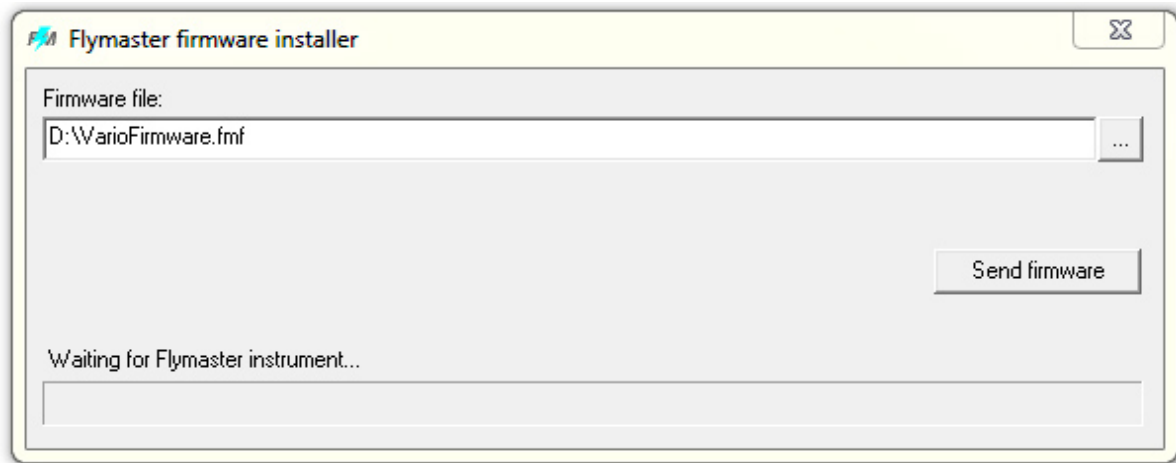
The first step of the updating procedure consists in installing the USB drivers. In order to do that you should run the drivers installation file and follow the on-screen instructions.

Next you need to install the update application, run the Flymaster firmware installer setup and follow the on-screen instructions.

Once the driver and the update tool are correctly installed do the following procedure.

1. Double click the firmware file, this will start the Flymaster Firmware installer, with the firmware path already inserted. Alternatively, open the Firmware installer, and insert the path to the firmware file. (see Figure. 20)
2. Click “Send Firmware” button. The message “waiting for Flymaster instrument...” will appear.
3. Connect the VARIO to the PC using the cable supplied. If it is the first time the VARIO is connected to the PC, wait until Windows show the message that new hardware is present a ready to use.
4. The update should start automatic, and a message appears saying “Programing...”, and a progress bar starts to grow. If after a few seconds nothing happens reset the VARIO(click at the **same time** the Menu and down arrow key for 2 seconds (see section 3.5)).

When the process is finish the application shows a message saying “complete”. Then disconnect the USB cable and the VARIO will start to work. Eventually, a message can appear asking for a Layout. If this happens the Designer software should be used to upload a new layout.



**Figure. 20- Firmware Installer**