

MICROALTI²

multifunction altimeter and vario
for paragliding, hang gliding and paramotor pilots



MANUAL

FAIRHAVEN
altivario.com

FAIRHAVEN Micro Alti 2

*The world's smallest, most sensitive, micro-power multifunction vario-altimeter.

The Micro Alti 2 is designed as an aid for paraglider, paramotor and hang-glider pilots to provide essential information and enhance your flying experience.

Based on the success of the original Micro Alti, the Micro Alti 2 has been redesigned from the ground up, using today's sensors and electronics, providing the ultimate sensitivity and battery life in a wristwatch size package!

Getting Started

To begin using the Micro Alti, switch on by pressing the middle button for about a second. To switch off, go to OFF on the middle button and press it for a second, or just keep the middle button pressed in any mode and it will shut down.

Press any button to move down its menu and use EXIT to leave any sub menus.

The separate quick guide sheet gives an overview of the menus.

Charge the Micro Alti via the USB socket if it doesn't function.

The time clock and timers are on the left button, altimeter and barometer references are on the right and various other functions are on the middle button. After displaying a function, for example temperature or altimeter type, that function will be remembered when you return to the button.

After checking the time, the menu will automatically return to the previous function without having to press it again, and after selecting the averager it will return to the current altimeter after a few seconds. If you press either of these functions a second time it will stay on that function, the vario will then be displayed above the time and altitude below the averager.

The middle button gives access to 3 sub menus when SUB is displayed:

The left submenu shows maximum readings for altitude, humidity etc.

The right sub menu allows you to adjust regular user settings.

The middle sub menu is accessible with a long press on SUB and gives access to less used settings, tests, serial number etc. Remember to use EXIT to leave any of the sub menus.

The Micro Alti is shipped in DEMO mode to let you see how it responds, but it may be too sensitive for general flying so we would recommend selecting DEFS (flying defaults) in the middle SUB menu and press the right button to make the change. You can also customise your settings in the right SUB menu.

The ALTI button



Three types of altimeter and barometers are accessed with the ALTI button. A quick press shows the altimeter or barometer name before displaying the reading, a further press while the name is displayed moves to the next.

QNE indicates altitude relative to the standard pressure of 1013.25mB. This is equivalent to pressure at mean sea level defined by the International Standard Atmosphere.

QNH can be set to the height of the hill or airfield, or a pressure reference.

After selecting QNH, hold the ALTI button to enter Height adjustment mode (H) then use left and right buttons followed by SET to store the displayed height or move to Pressure setting mode (P). This is adjusted in the same way and is usually set to the pressure given by the local airfield.

ALTI 1, 2 and 3, can be zeroed with a long press and can be used as your take-off reference. ALTI 1 measures altitude in 10cm steps (or 4 inches) reverting to 100cm steps above 1999.9

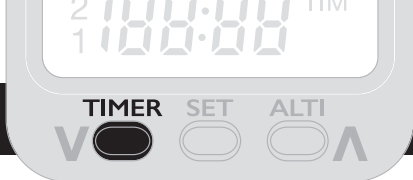
The next option on the ALTI button is **BARO**. This will indicate your local barometric pressure which will usually differ from barometric pressure in weather reports which are referenced to sea level. Increasing altitude will cause a decrease in pressure by approx 1mB per 30 feet above sea level, decreasing at higher altitudes.

This is followed by **PRESSURE CHANGE** which records how local air pressure changes over time and can give an indication of a potential trend in the weather, for example when a low pressure system is approaching. Allow an hour or so for the trend indicator to register any change or leave it on overnight before you fly.

In PRESSURE CHANGE mode the segmented scale indicates in quarter millibar increments. Current pressure is indicated by a flashing segment while other segments will have registered previous pressure excursions. This can be reset to the current pressure with a long press on the ALTI button.

This function will be affected if you fly or change altitude and is only provided as a guide if you are deciding whether to fly.

The **TIMER** button



The **TIMER** button gives access to the **time clock, alarm timer and stopwatch**.

An initial press of the **TIMER** button shows the current time and will automatically revert to its previous mode (current altimeter, temperature etc.) without further key presses. Press again to keep the clock displayed along with the vario.

Clock setting: A long key press allows you to set the clock. First hours will flash and can be adjusted with the left and right keys, use the **SET** button to set hours and then set minutes in the same way.

A third press gives the **ALARM** timer which can be used to set a reminder or time events. If you are using your Micro Alti with a paramotor headset, the alarm timer can be used as a prompt when your fuel tank is likely to be low or half full, providing you first familiarise yourself with your fuel consumption. The alarm timer will permanently store the setting, so the same duration can be used again.

Alarm setting: A long key press on the TIMER button allows hours to be set using the left and right buttons followed by the SET button. Minutes can then be set in the same way. Press the SET button again to begin the countdown and ALARM ON will be displayed before returning to the altimeter.

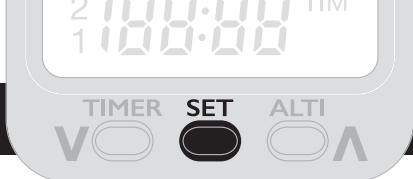
When the alarm sounds, press the middle button to silence it. You can cancel the alarm at any time by returning to ALARM and holding the left button, this will be confirmed with ALARM OFF. Switching off the Micro Alti will also cancel the alarm.

The last option on the TIMER button is the **stopwatch**.

STOPWATCH AUTO START (flight timer) can be initiated with a long key press on the left button and READY will be displayed. The stopwatch will then start as soon as height changes by +/- 30 feet or 10 metres.

The **stopwatch** can also be started, **paused and restarted** with further key presses and can be **zeroed** with a long press on the TIMER button. Press any other key to exit.

The Middle Button



The first item on the middle button is the **averager**. This is a useful tool to find your overall rate of climb when flying conditions create short bursts of lift and sink.

The averager is selected on the middle button along with the averaging time, e.g. AV 20 (20 second averaging). It will return to the current altimeter after a few seconds but a further press leaves it in averager mode along with the altimeter reading. The averager is shown as a black band of petals and the normal vario rate is also shown as a single flashing petal in this mode. The audio tones will still respond quickly if lift or sink is encountered.

The **averager** can be adjusted to smooth out variations of lift and sink over a 1 to 60 second period and can be set with a long press on the middle button or in the right sub menu, which is explained further down the manual.

The **vario** is displayed next (shown with a V) and has a numerical readout of 0.1 metres per second in this mode and a resolution of up to 10mm per second on the petal display. The sensitivity of the petal display can be set with a long press or in the right settings menu.

Battery shows the actual battery voltage. The upper segments of the display will only indicate while charging, after which a full charge is indicated with around 80% of the segments showing, which is around 4 volts. “BAtt” will flash whenever the battery voltage drops to level “2” on the battery display. To avoid damaging the battery, recharge if it becomes empty.

The time clock has a separate back-up battery and is recharged along with the main battery.

The **G-Meter** is the next option on the SET menu and this shows the strength of gravitational or centrifugal force acting on the pilot and normally indicates approximately 1G at rest, displayed as G 1_00

Higher “G” may be encountered during a turn or dive and the G-Meter will indicate this to 2 decimal places, for example: G 2_15 (i.e. just over twice the Earth’s gravitational force).

The **maximum G-force** encountered during your flight can be seen in the left sub menu. This will be permanently stored and will only be updated if higher G-force is registered. This reading can be reset back with a long key press.

This is followed by **temperature** in degrees Celsius which equates to local air temperature if the vario is not heated by sunlight or body temperature etc. A long press gives temperature in Fahrenheit.

Humidity % is shown next and can be a useful indication of saturation as you approach cloud formations.

The final menu item is the **FM radio**. This option is included as many people use devices to listen to music in flight and the Micro Alti is a convenient choice as the vario tones are blended with the radio. While we don't encourage activity that might distract from the task of flying, listening to music is generally allowed if done with due caution and does not divert your attention; for example on cross country flights, and away from obstacles or groups of other paragliders. You may consider using a single 'over the ear' headphone so that you can still listen out for other aircraft. While you are on the ground, you may want to catch a weather forecast, keep up with the sport or pass the time waiting for the perfect opportunity to fly!

Operating the radio

Plug an earpiece or headphones into the socket on the top of the Micro Alti.

The radio is switched on with a long press on the **FM RADIO** option. Left and right buttons change the radio stations stored in memories 0-9. (Several frequencies are already stored for testing, so it should find a station straight away). A further press on the middle button gives the volume control which is operated with the left and right buttons, followed by the MONO/STEREO control, then EXIT and OFF. (EXIT will leave the radio on after pressing the left and right buttons, OFF will exit with the radio switched off).

Storing stations: A long press on the middle button in memory mode will cause it to begin scanning and the radio will stop when it finds a station. You can press again to continue scanning or use the left and right buttons

to chose a memory number, then press the SET button to store the station. A long press on left or right will exit scanning mode without storing a station. The vario tones are also sent to the headphone socket and the volume of the radio should be adjusted to give a suitable blend.

Note: If FM is indicated on the display the radio will be switched on and consuming power!

Sub Menus

Press the **middle button** to go to SUB MENUS, then **left and right buttons** to access the two main sub menus, continue down the menus with the middle button. The middle sub menu is explained later in the manual.

Left Sub Menu

The left Sub Menu shows **maximum and minimum readings** relating to your flight. All readings are stored permanently and can be individually reset with a long key press. Vario and G-Meter readings are visually represented on the petal display starting from the left. 1- indicates that a vario reading has gone over the maximum of 19.

Maximum lift is followed by **maximum altitude**, then **maximum sink**, followed by **minimum altitude**. High and low readings are generally indicated with H and L. This is followed by maximum and minimum **temperature** then maximum **humidity %** and maximum **G force**. **EXIT** followed by left or right buttons returns to clock or altimeter displays.

Right Sub Menu

PIZO - Allows the piezo bleeper to be turned off when not required by selecting “n”, selecting “Y” will turn the vario’s tones back on. Select “A” to allow the tones to turn on automatically if barometric pressure changes by more than 1mB. This will silence the vario until you begin flying.

AVERAGER SETTING - Allows the averaging display to be set between 1- 60 seconds.

SENSITIVITY - Sets the sensitivity of the vario scale. On the secondary scale, petals reduce from the centre of the display as the rate of climb/descent increases.

Setting	Petal sensitivity	Full scale	Secondary scale	
11	5 mm/s	50 mm/s	0.1 m/s	
10	10 mm/s	0.1 m/s	0.2 m/s	DEMO setting
9	20 mm/s	0.2 m/s	0.4 m/s	
8	50 mm/s	0.5 m/s	1 m/s	^ More sensitive
7	0.1 m/s	1 m/s	2 m/s	
6	0.2 m/s	2 m/s	4 m/s	DEFS (Flying defaults)
5	0.5 m/s	5 m/s	10 m/s	Thermal flying
4	1 m/s	10 m/s	20 m/s	General Aviation
3	2 m/s	20 m/s	40 m/s	
2	4 m/s	40 m/s	80 m/s	v Less sensitive
1	5 m/s	50 m/s	100 m/s	

VOLUME - Sets the volume of the bleeper in 20 steps. Use the left and right buttons to set the level as required. This does not affect the headset volume. Lower volume levels will give slightly longer battery life.

UP threshold (UP th) - This sets the climb rate at which the vario begins to bleep. The threshold can be adjusted with the left and right buttons to prevent excessive triggering.

DOWN threshold (DN th) - A continuous tone Indicates that the glider is descending. You may wish to set the down threshold to only respond when you are descending rapidly, as a warning that you are in rapidly sinking air.

WEAK LIFT FINDER - The “Weak Lift” or “Thermal Finder” is used to indicate rising air even when the glider itself is not ascending! This would usually be set to the sink rate of the glider, then if rising air reduces the rate of sink above this point, the Weak Lift Finder will start to chirp and speeds up as level flight is approached. The default threshold is set to 1100 mm/second, which is typical for modern paragliders. Left and right buttons adjust the threshold and the Weak Lift Finder tones can be switched off if set to zero or “n” in the middle sub menu.

VARIO DAMPING - This controls how quickly the vario’s audio and visual indications respond to changes in height. A short response will cause the vario to respond quickly, but it may respond too readily to small changes such as when wind is buffeting the vario. You may prefer a slower response which will average out small and rapid variations. Once you are flying, the Micro Alti will tend to silence until lift is detected.

PACE of tones - This sets the scale of the vario's tones. So if you are generally searching for small amounts of lift, such as when ridge-soaring, a high setting will make the vario more responsive to small altitude changes. If, on the other hand, you are used to flying at higher climb rates, such as when thermalling, a lower setting will be more useful as the audio tones will vary more gradually over a larger range.

Unit - Allows metric or imperial units to be selected.

1. Metric altimeter and vario in metres per second.
2. Altitude in feet and vario in feet (x100) per minute.
3. Altitude in feet and vario in metres per second.

G-METER AUDIO – Selecting this option (with a press on the right button) provides a range of tones (similar to the vario) to indicate G force, providing audible feedback in acrobatics and training. Selecting VARIO AUDIO reinstates the regular vario tone system.

EXIT - Use left or right buttons to exit.

Middle Sub Menu

The middle sub menu is accessible with a long press on SUB and gives access to less-used settings, tests, serial number etc. Short presses then cycle the options below, use left and right buttons to change settings.

DEMO - Sets the Micro Alti to be highly responsive to demonstrate its operation. Lift tone=30mm/second, Lift finder threshold=1.1m/s, sink threshold=800mm/s.

DEFS - Loads typical flying defaults: Lift tone=100mm/second, Lift finder threshold=1.1m/s, sink threshold=2m/s.

SHUT DOWN TIMER - Automatically shuts off the Micro Alti when there is no activity, to save the battery. The timer can be set from 1 minute to 6 hours. If any buttons are pressed or the pressure changes by more than 1mB, the timer will reset and the Micro Alti will stay awake.

When the Micro Alti is about to shut down, it will bleep and show “SHUTTING DOWN” on the screen.

The countdown timer can be disabled if set to OFF. It will also be disabled when in PRESSURE CHANGE mode, so that the pressure trend can be monitored over a long period.

WEAK LIFT FINDER - Switches weak lift finder on or off.

LED ON - Switches the blue Lift LED on or off. (Off prolongs battery life).

USB ON/OFF - Enables USB port for communication with other devices.

DATA FORMAT - Select NMEA or hexadecimal USB data formats with right or left buttons.

G th - Provides a threshold to prevent the G-Meter from randomly triggering the tone system.

CHG.H / CHG.L - Changes from high to low battery charging to extend battery lifetime.

EXIT - Use left or right buttons to exit, or exit further down the menu.

PIZO CHECK - Bleeps to check the piezo bleeper.

LCD CHECK - Turns all LCD segments on.

CONTRAST - Changes the contrast of the LCD.

EXTENSION BLEEPER - Changes the headphone jack output to drive a piezo extension bleeper.

G CAL - Provides calibration of the G-Meter which may need to be set up initially or if the G-Meter does not show approximately 1G at rest. To do this, press and hold the SET button and “Flat” will appear in the display. Place the Micro Alti on a flat, stationary surface and press the left button. The G-Meter will then calibrate itself and will be ready for use. If the right button is pressed, factory defaults will be restored.

CLOCK ADJUST - Allows adjustment if clock is running fast or slow.

QNE ADJUST - Allows the QNE reading to be adjusted to compensate for small changes as the altimeter’s pressure sensor ages. We don’t recommend this without having a precision reference for comparison.

BARO ADJUST - Allows the Barometric pressure reading to be adjusted to a known reference, taking into account your height above sea level. Note that QNE and Barometric pressure will both change when adjusted. QNE will always be zero when barometric pressure equals 1013.25mB.

FW VERSION - Shows the firmware version. Fairhaven will occasionally provide updates to improve features and operation of the Micro Alti.

SN (SERIAL NUMBER) - Displays the Micro Alti 2’s unique serial number. (You may wish to take a note of this).

ERROR CODE - Shows last error logged by the processor for debugging. Usually 2083 (power off).

DEBUG MODE - Sends live data variables to the USB port which can be viewed with a terminal program for fault analysis.

EXIT - Use left or right buttons to exit.

Headphone/external bleeper socket

As well as having an internal audio sounder or “bleeper” the Micro Alti’s headphone socket can connect to an **external piezo bleeper** that can be worn under the helmet or inside a headset cup. This is particularly useful to paramotor fliers who make use of thermals to extend their flights.

For helmets that are open around the ears, the extra piezo bleeper can still be heard when mounted near to the ear, in the padding of the helmet.

Any type of stereo earbuds can be used too, or the Micro Alti can be connected to an intercom for tandem or sailplane gliding, to your paramotor headset auxiliary input, or with an earpiece if you have impaired hearing. You can set the Micro Alti to suit a headset or piezo bleeper in the middle sub menu. The volume of the vario tones in the headset is independent of the volume settings for the internal bleeper, which can be turned off if not required.

Note: When using a piezo extension bleeper, use a stereo jack plug and leave the jack’s ring unconnected. (Fairhaven can supply this part).

Audio tones

The **lift tone** is a “bleep-bleep” that increases in rate and pitch as rate of climb increases.

The **thermal finder tone** is a short chirp that increases in frequency above the glider’s sink rate and the **sink tone** is continuous tone that starts high and reduces in frequency indicating sinking air. Use the Right Sub Menu to customise the vario’s tone response.

Mounting

The Micro Alti can be mounted on your wrist, over a coat sleeve or on your risers, or it can be panel-mounted in sailplane gliders etc.

We supply a velcro strap that can be cut down as required and adhesive Velcro pads that will stick to most surfaces and can be sewn onto clothing. Additionally we supply a lanyard which should be fastened through the strap retainer on the rear of the Micro Alti and slipped around your wrist or riser for extra security. Ensure that this will not entangle with lines or controls.

The strap retainer on the back of the Micro Alti can be fixed horizontally or vertically or removed if the Micro Alti is mounted onto a flat surface. Take care when replacing the 4 screws. Engage the threads by turning the screws slightly anti-clockwise before tightening. Do not over tighten.

Battery

The battery is a 100mA re-chargeable lithium polymer type that is automatically recharged when the Micro Alti is plugged in to any USB 5 volt supply, such as a computer, phone charger, sat-nav lead or solar charger and we have included a charger that plugs into your car's cigarette lighter socket.

Charging is indicated with a red LED and a charge of approximately one hour can give over 60 hours of autonomy (depending on use). If the FM radio is in use, battery life will be around 8 hours. The charger will switch off and the light will extinguish when fully charged, and even a short charge is sufficient for most flights! We can supply new batteries if required which can be fitted by the user.

Note: This product is designed as an aid to amateur flying under visual flight rules. It is not guaranteed for use in obstacle or aircraft avoidance.

The specification may change from time to time and any claims relate to the device at time of manufacture and in relation to devices of that specific type.



MICRO **ALTI 2**

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