



ECHO is a trademark of LB Altimeters, Denmark

LB Altimeters operates a policy of continuous development  
Therefore, we reserve the right to make changes and improvements to any of the  
products described in this guide without prior notice

## WARNING

### **This product is only for professional use**

The **ECHO**, even when used as your primary means of maintaining altitude awareness, may fail. Always use your eyes to determine your approximate altitude.

Altimeters may give erroneous readings if you are tumbling or the altimeter is in a burble (wake). Chest mount altimeters are more vulnerable to this problem compared to hand/wrist mounted altimeters. If you are in doubt about how this limitation affects your skydiving, consult a licensed instructor

DO NOT use this equipment unless you are currently participating in, or have successfully passed, an approved parachuting or free fall course

Please read ALL instructions carefully prior to use

The **ECHO** must be switched **ON** prior to entering the airplane

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# INTRODUCTION

The **ECHO** is the most high-end, accurate, and reliable audible altimeter to be developed by LB Altimeters to date. The **ECHO** software includes second-to-none error correction to ensure correct live altitude readings in any application

## Features

- Audible altimeter
- 4 climb to altitude warnings
- 4 high speed warnings
- 4 low speed warnings
- 3 preset memory banks for quick User change
- Large high contrast, non-flicker, LCD display
- Waterproof and shock resistant aluminum casing with hardened glass
- Quick buttons for access to primary functions
- IR access functionality, to use with optional **AltiSet II** Remote Control

## Functions

- Calibration to the local elevation
- User selection of feet / meter
- User selection of pre-set Modes:
  - o Tandem
  - o Student
  - o Expert
- User setting of warnings
- Optional: Super User setting to ACCESS warnings

## DESCRIPTION

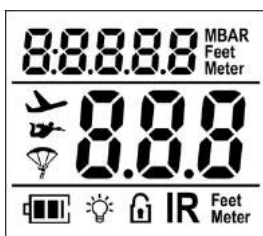
- 1 Altitude Offset / Up
- 2 Main
- 3 Backlight / Down
- 4 Display
- 5 Battery cover
- 6 Reset button
- 7 IR port
- 8 LEDs



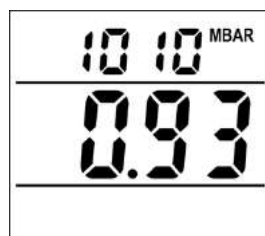
## DISPLAY

### Startup

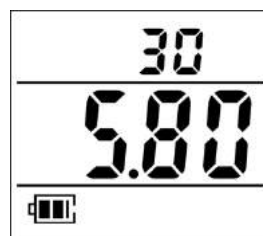
When turning ON **ECHO**, the unit will display the following during the startup self-test



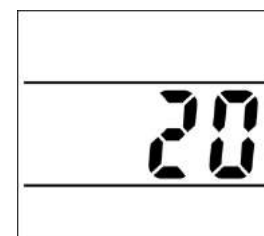
Full display



Air pressure reading (mbar)  
Firmware version



Temperature (Celsius)  
Battery voltage (V)



Self-test control number

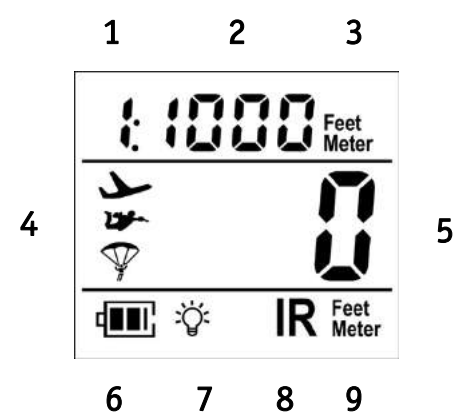


LED lights ON test

### Main window

The main window is the default window after the unit is turned ON, and starting point for any further actions

- 1 Warning number (flashing)
- 2 Warning altitude
- 3 Feet / meter indicator – Warning altitude
- 4 Warning type
- 5 Altitude display (flashing when negative)
- 6 Battery indicator
- 7 Backlight indicator
- 8 IR Mode indicator
- 9 Feet / meter indicator – Altitude display






## Jump Mode LED

1 of 3 colored LEDs will flash below the main window to display the current Jump Mode (while LED setting is ON):

## Warning Type

The icon will show the selected warning type for display and settings:

-  Climb to Altitude warning
-  High Speed warning
-  Low Speed warning

## Warning Display

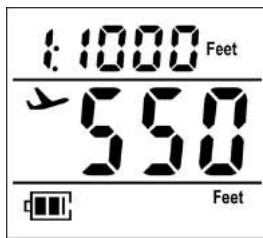
All warnings can be displayed in the top 3<sup>rd</sup> of the main window by using Quick Buttons to scroll

## Settings / Warning Settings

Display examples, after performing ACCESS, are shown in the separate sections

## Altitude Window

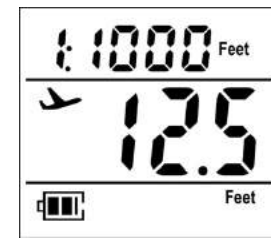
Shortly after take-off, the main window will automatically display altitude readings  
The displayed altitude increments (feet / meter) depend on the current altitude



**0 - 990**  
*Altitude display: Normal*  
*Increments of 10 feet / 5 meters*







**1.000 – 9.990**  
*Altitude display: 10s*  
*Increments of 10 feet / 10 meters*



**10.000 and above**  
*Altitude display: 100s*  
*Increments of 100 feet / 100 meters*

## Battery Indicator

The battery indicator shows the current battery status

-  Full capacity: Two black bars are shown inside the battery symbol
-  Half capacity: One black bar is shown inside the battery symbol
-  Low capacity: The battery symbol is empty. The batteries must be replaced as soon as possible
-  Empty: The battery symbol is flashing. Do not continue jumping. Replace batteries immediately

Warning: Do not perform night jumps, or jumps in sub-zero temperatures (Celsius) when the battery symbol shows low capacity

## WARNINGS

The ECHO has 3 different types of audible warnings:

### Climb to Altitude Warning:

While climbing in the aircraft, each preset warning will sound a series of beeps starting at the lowest preset altitude

Up to 4 different warnings can be preset (factory setting being 1 warning at 1000 ft. / 300 m);

- 1<sup>st</sup> warning:
- 2<sup>nd</sup> warning: One 0.2 second beep
- 3<sup>rd</sup> warning: Two 0.2 second beeps
- 4<sup>th</sup> warning: One 1.3 second beep

The 1<sup>st</sup> warning will also:

- Verify functionality of the ECHO
- Indicate the altitude at which the highest preset High Speed warning sounds (one beep per 1000 ft., followed by a pause and another beep if preset an additional 500 ft.)

### High Speed Warning:

During a vertical descent with speed over of 13 m/sec, each preset warning will sound a series of beeps as follows

Up to 4 different warnings can be preset;

1 <sup>st</sup> warning:	One 1.5 second alarm.	(Pulsating, low repetition)
2 <sup>nd</sup> warning:	One 3 second alarm.	(Pulsating, low repetition)
3 <sup>rd</sup> warning:	One 4 second alarm.	(Pulsating, high repetition)
4 <sup>th</sup> warning:	One continuous siren.	(High pitch siren, continuous while vertical speed is over 13 m/sec)

Note: After **ECHO** registers deployment, a vertical descent with speed over of 35 m/sec must be reached before High Speed Alarms activate.

### Low Speed Warning:

During descent, each preset warning will sound a series of beeps starting at the highest set altitude

Up to 4 different warnings can be preset;

1 <sup>st</sup> warning:	One 0.2 second beep
2 <sup>nd</sup> warning:	One 0.2 second beep
3 <sup>rd</sup> warning:	Two 0.2 second beeps
4 <sup>th</sup> warning:	One 1.3 second beep

Note: When selecting Guide ON, a series of 5 beeps will 'count down' from the 3<sup>rd</sup> to the 4<sup>th</sup> warning. The time between the beeps will shorten as the 4<sup>th</sup> warning is approached

### Disable Warning(s):

Less than 4 warnings can be selected for each type, by setting 2 or more alarms to the same altitude or zero '----':

### Climb to Altitude Warning:

1 warning set to '----':	1 <sup>st</sup> , 2 <sup>nd</sup> , and 3 <sup>rd</sup> warnings will be used
2 warnings set to '----':	1 <sup>st</sup> and 2 <sup>nd</sup> warnings will be used
3 warnings set to '----':	1 <sup>st</sup> warning only will be used

### High Speed Warning and Low Speed Warning:

1 warning set to '----':	2 <sup>nd</sup> , 3 <sup>rd</sup> , and 4 <sup>th</sup> warnings will be used
2 warnings set to '----':	3 <sup>rd</sup> , and 4 <sup>th</sup> warnings will be used
3 warnings set to '----':	4 <sup>th</sup> warning only will be used

Note: To re-enable any warning, select an altitude above zero

## JUMP MODE and MEMORY BANK

**ECHO** has 3 color coded Jump Modes, each with a Memory Bank:

Yellow / Student  
Blue / Tandem  
Red / Expert

The Memory Bank contains 4 Climb to Altitude warnings, 4 High Speed warnings, and 4 Low Speed warnings. All Memory Banks are stored on **ECHO** while switching Jump Mode.

# MENU OVERVIEW

The ECHO menu system consists of 3 separate areas, which include the following (use road map for reference)

Quick Buttons	Settings	Warning Settings
<ul style="list-style-type: none"> <li>Turn ON unit</li> <li>Warning Display</li> <li>Altitude Offset</li> <li>IR Mode</li> <li>Backlight</li> </ul>	<ul style="list-style-type: none"> <li>Mode</li> <li>LED ON / OFF</li> <li>Scroll ON / OFF</li> <li>Units - Altitude</li> <li>Sound Pitch</li> <li>Sound Test</li> <li>Guide ON / OFF</li> <li>Guide Test</li> <li>OFF</li> </ul> <p style="text-align: center;">ACCESS to Warning Settings</p>	<ul style="list-style-type: none"> <li>Climb Warnings</li> <li>High Speed Warnings</li> <li>Low Speed Warnings</li> <li>Super User Lock</li> </ul>

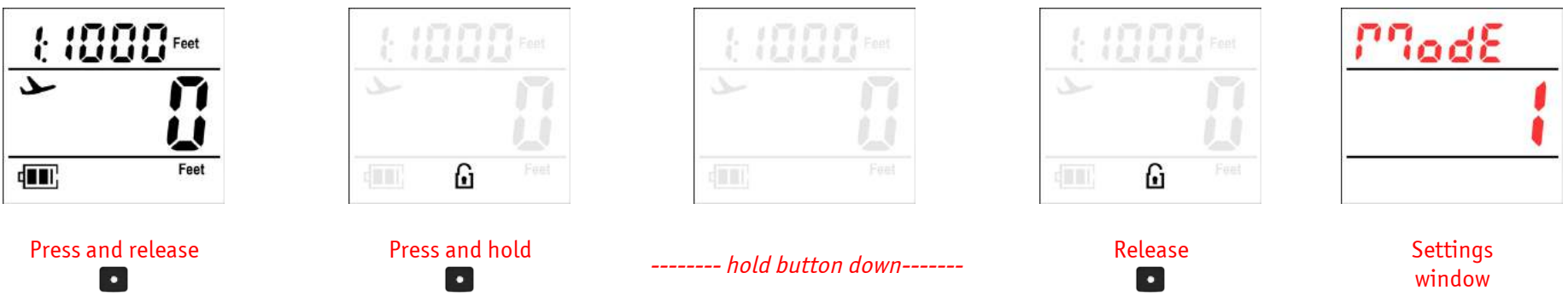
## PERFORMING ACCESS

In order to access each of the individual areas, the following steps must be performed from the main window (use road map for reference)

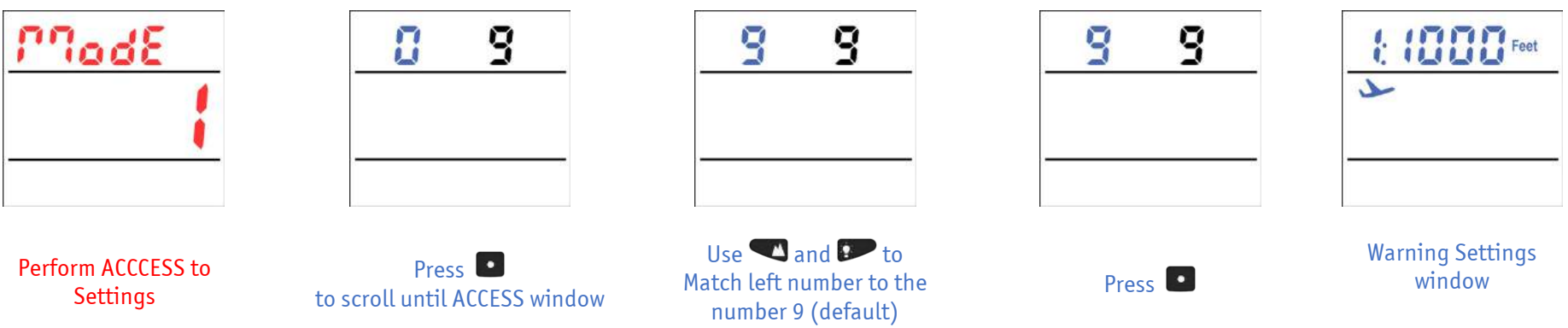
### Quick Buttons

Press and hold the designated button for 5 seconds

### Settings



### Warning Settings



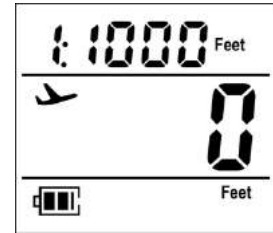
## QUICK BUTTONS

Quick Buttons are accessible from the Main Window and do not require ACCESS

### Turn ON unit

Turn ON **ECHO** on the ground before use. The unit runs a self-test and calibrates to the current ground level  
The **ECHO** will stay turned ON for 14 hours after the last jump or after last ACCESS performed

With the unit OFF, press and hold any button for 5 seconds



If **ECHO** is turned on during flight, the present altitude must be adjusted manually

### Altitude Offset

Use Altitude Offset to adjust for altitude difference between landing zone and take-off elevation



To ensure proper ground reference on landing zone:

Select a **positive altitude** offset, if take-off elevation is **HIGHER** than the landing zone  
Select a **negative altitude** offset, if take-off elevation is **LOWER** than the landing zone

Alternatively enter the absolute air pressure for the landing zone:

Select the **mbar value** registered/calculated for the landing zone

Press and hold  for 5 seconds

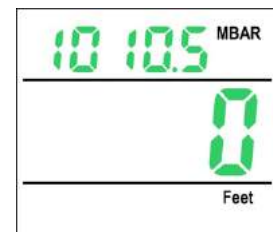
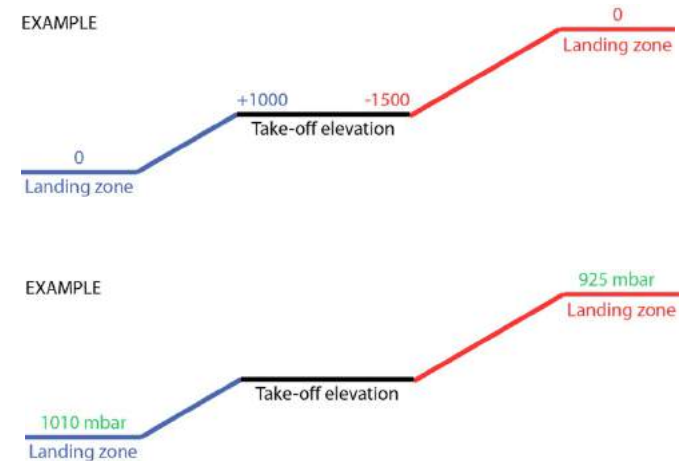
Press  to increase altitude/mbar  
Press  to reduce altitude/mbar

Press  to confirm Altitude Offset setting

The Altitude Offset will now be displayed in the main window  
(flashing when negative)

Altitude Offset must be confirmed within 15 seconds following an altitude change  
Altitude Offset is cancelled if no button is pressed within 15 seconds

Note: If using Altitude Offset during flight either use the aircraft altimeter for reference, or enter the absolute air pressure for the landing zone




### IR Mode

Activate/Deactivate IR Mode for communication with **AltiSet II** remote control

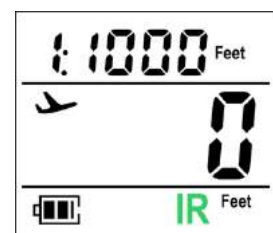
Press and hold  for 5 seconds

**IR** will flash and IR mode is active for 2 minutes


Activate IR Mode on **AltiSet II**  
Point the **AltiSet II** at the IR port  
**ECHO** adjusts to the **AltiSet II** preset altitude, warnings, and/or backlight

Press  to exit IR mode

Note: Refer to the **AltiSet II** manual for more information on using the **AltiSet II** remote controls



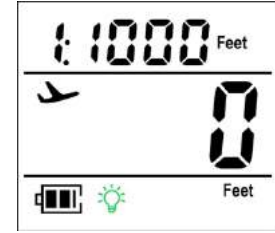
## Backlight

 Indicates if backlight is ON or OFF

Enable/disable backlight:

Press and hold  for 5 seconds

Backlight will turn OFF automatically after 10 minutes, if **ECHO** is not in Flight Mode Backlight will remain ON while **ECHO** is in Flight Mode





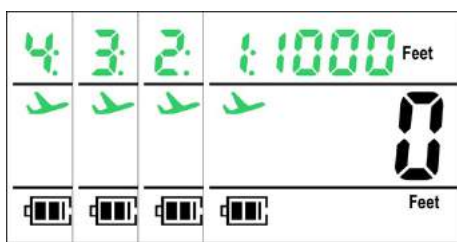
## Warnings Display

In the Main Window the Warnings can be scrolled through manually, or automatically.

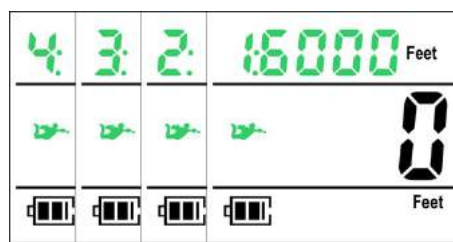
The Warning number and set altitude will be displayed in the top section of the LCD screen, separated by a colon

Note: The flashing LED will show the current Jump Mode selected.

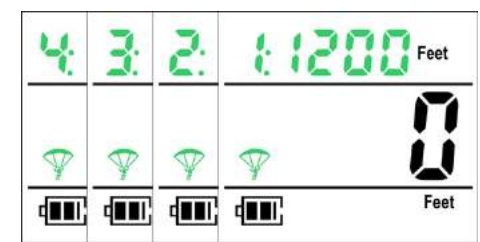
Press  to select previous Warning  
Press  to select next Warning



Climb to Altitude Warnings



High Speed Warnings



Low Speed Warnings


Note: If Scroll is ON in Settings, Warnings will automatically scroll in the Main Window without pressing any buttons



# SETTINGS

Settings are used to customize the ECHO

Perform ACCESS to enter the first entry of Settings



Press  to scroll through all settings

ECHO will exit Settings if no button is pressed within 15 seconds

## Jump Mode

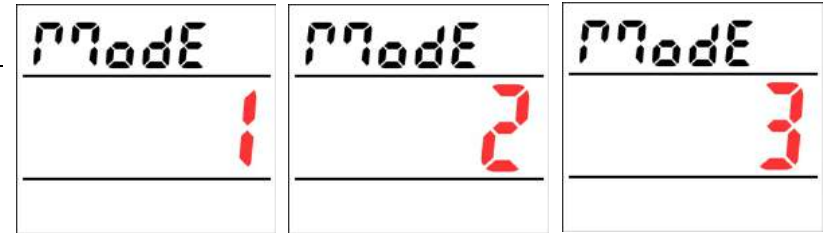
Sets the current Jump Mode.

- 1: Yellow / Student
- 2: Blue / Tandem
- 3: Red / Expert

Press  to select previous Jump Mode  
Press  to select next Jump Mode

The LED will light up to display the selection made

Press  to continue

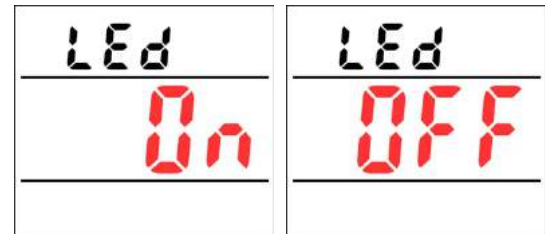


## LED ON / OFF

Will activate or de-activate the LED for displaying Jump Mode

Press  or  to switch ON / OFF


Press  to continue



## Scroll ON / OFF

Will activate or de-activate the Scroll setting for Warnings in the Main Window

Press  or  to switch ON / OFF


Press  to continue

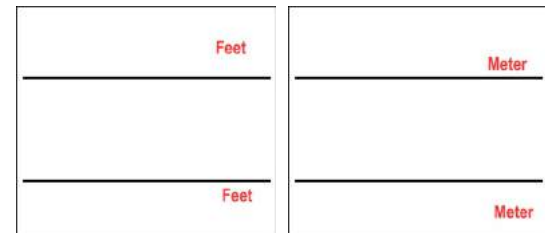


## Altitude Units

Sets altitude display in either feet or meters

Press  or  to switch units



Press  to continue




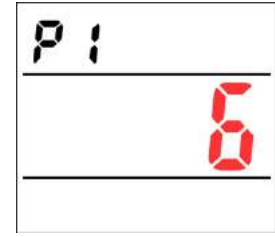
## Pitch

Change the pitch of the Warning audible sounds

The pitch can be selected in the range of 1 (lowest pitch) to 9 (highest pitch)

Press  to increase the pitch  
Press  to decrease the pitch

Press  to continue

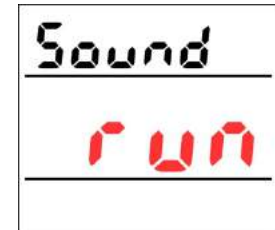


## Sound Test

Will test the High Speed Warnings by sounding each one in succession

Press  or  to start sound test

Press  to continue



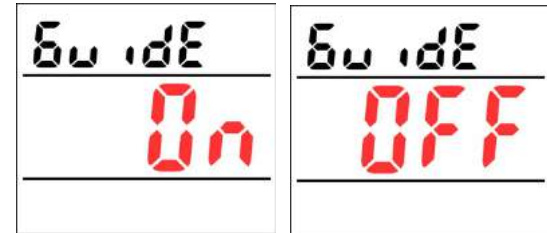
Note: The Warning Altitude will display at the top of the window during the test

## Guide ON / OFF

Will activate or de-activate the Guide for Low Speed Warnings

Press  or  to switch ON / OFF


Press  to continue

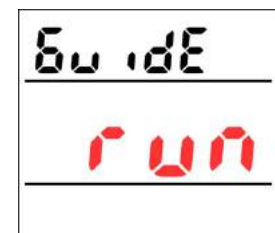


## Guide Test

Will test the Guide for Low Speed Warnings

Press  or  to start sound test

Press  to continue






Note: The Warning Altitude will display at the top of the window during the test


## Turn OFF


Turns ECHO OFF

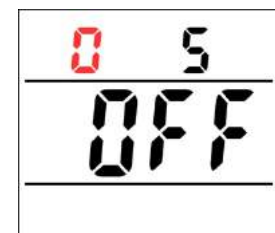
To avoid unintentionally turning the ECHO OFF, the counter at the top of the screen must be set to '5'

Press  and  to match counter to '5'  
Press  to accept turning ECHO OFF

### Warning:




If the counter is set at '5',  cannot be used to scroll through settings and will turn ECHO OFF

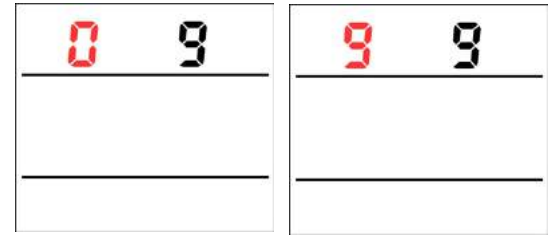
Press  to continue




## ACCESS to Warning Settings

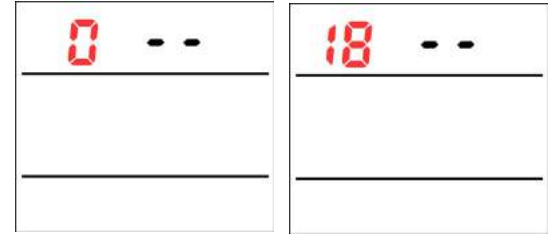
Performs ACCESS to Warning Settings

Press  and  to match left number to the number '9' (Default)  
Press  to accept




**Warning:**  
If '--' is displayed on the right side, the default number has been changed and the unit is locked for Super User only. ACCESS can only be performed matching the left number to the correct hidden number.



Press  to continue




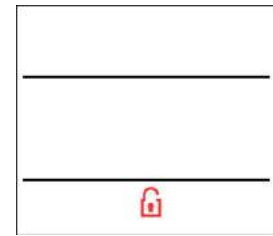
## Exit Settings

 is flashing

Allows manual exit from Settings

Press  or  to exit from Settings

Press  to start from the beginning




## WARNING SETTINGS

Warning Settings are used to customize the ECHO audible Warnings


Perform **ACCESS** to enter the first entry of **Settings**

Perform **ACCESS** to enter the first entry of **Warning Settings**

Press  to scroll through all Warnings for the selected Jump Mode

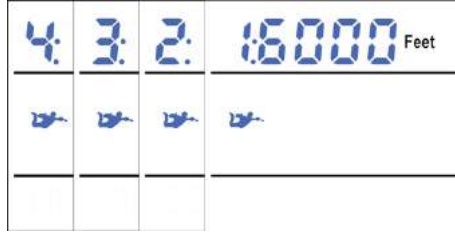
ECHO will exit **Warning Settings** if no button is pressed within 15 seconds

### Select Warning

Press  to scroll through all Warnings for the selected Jump Mode, starting with 1<sup>st</sup> Climb to Altitude Warning  
The Warning number and altitude will be displayed in the top section of the LCD screen, separated by a colon



Climb to Altitude Warnings



High Speed Warnings






Low Speed Warnings

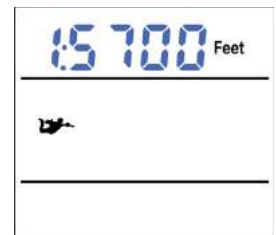
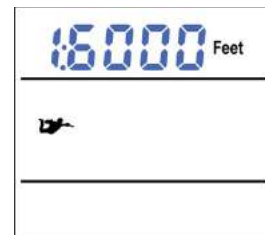
Note: The LED will show the current Jump Mode selected.

### Change Altitude

Change the altitude of the selected Warning

Press  to increase altitude  
Press  to decrease altitude

Press  to confirm altitude and continue



ECHO automatically sort the entered altitudes in order:

Climb to Altitude: 1<sup>st</sup> Warning will be lowest altitude, 4<sup>th</sup> Warning will be highest altitude


High Speed Warning: 1<sup>st</sup> Warning will be highest altitude, 4<sup>th</sup> Warning will be lowest altitude


Low Speed Warning: 1<sup>st</sup> Warning will be highest altitude, 4<sup>th</sup> Warning will be lowest altitude

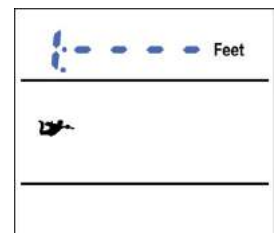
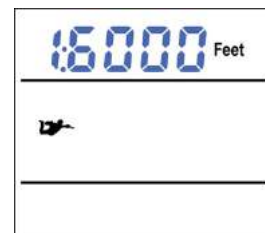
Note: If same altitude is selected as an existing Warning of same type, the Warning will be disabled.

### Disable Warning

Will disable the Warning

Press  to decrease altitude to zero '----'


Press  to confirm altitude and continue





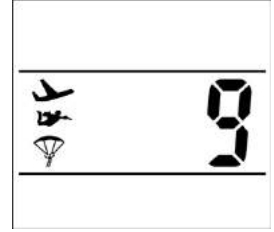
Note: To re-enable any Warning, select an altitude above zero

## ACCESS Code

Sets hidden ACCESS code for Warnings Settings menu

Press  to cycle through all Warnings until the ACCESS code window

Press  or  to switch ACCESS code

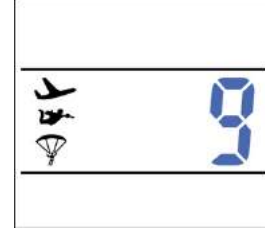


Press  to confirm and continue

**Warning:**


If any other number is selected other than '9' (default), the unit is locked for Super User only and '--' will be displayed in the Settings window when performing ACCESS

ACCESS can only be performed matching the left number to the correct hidden number






Note: To reset ACCESS code to '9' (default), a factory reset must be performed

## Exit Settings

 is flashing

Allows manual exit from Warning Settings

Press  or  to exit from Warning Settings

Press  to start from 1<sup>st</sup> Climb to Altitude Warning



## FUNCTIONALITY

### Automatic Calibration / Flight Mode

After the **ECHO** is turned ON, it will continue to automatically calibrate itself to the field elevation where it is currently located. This will continue after each jump / landing, to ensure the unit is always zeroed before jumps are made and will take into account weather related pressure changes.

After take-off, the **ECHO** will enter Flight Mode.

### Altitude Offset

When performing Altitude Offset, the **ECHO** enters Flight Mode and will retain any offset for 14 hours if no jump is made. After 14 hours the unit calibrates itself to the field elevation where it is located.

To exit Flight Mode, turn the unit OFF, then ON.

### Manual Zeroing

If the unit does not display the correct altitude when arriving at the drop zone, it must be manually zeroed

Turning the unit OFF, then ON, will clear any Altitude Offset and re-enter automatic calibration

### Automatic OFF

The **ECHO** automatically switches OFF if no jump has been made within 14 hours, no button has been pressed within 14 hours, or the unit has not been in Flight Mode within 14 hours

### Factory Default Warnings

#### Yellow / Student Jump Mode:

	1 <sup>st</sup> Warning	2 <sup>nd</sup> Warning	3 <sup>rd</sup> Warning	4 <sup>th</sup> Warning
Climb to Altitude Warning:	1000 feet	'----'	'----'	'----'
High Speed Warning:	'----' feet	6000 feet	4500 feet	2300 feet
Low Speed Warning	1200 feet	900 feet	600 feet	300 feet

#### Blue / Tandem Jump Mode:

	1 <sup>st</sup> Warning	2 <sup>nd</sup> Warning	3 <sup>rd</sup> Warning	4 <sup>th</sup> Warning
Climb to Altitude Warning:	1100 feet	1200 feet	'----'	'----'
High Speed Warning:	7000 feet	5500 feet	4000 feet	3000 feet
Low Speed Warning	2200 feet	1900 feet	1600 feet	1300 feet

#### Red / Expert Jump Mode:

	1 <sup>st</sup> Warning	2 <sup>nd</sup> Warning	3 <sup>rd</sup> Warning	4 <sup>th</sup> Warning
Climb to Altitude Warning:	1200 feet	1300 feet	1400 feet	'----'
High Speed Warning:	8000 feet	6500 feet	5000 feet	4000 feet
Low Speed Warning	3200 feet	2900 feet	2600 feet	2300 feet

## MAINTENANCE

### Reset ECHO

A reset may be necessary for troubleshooting and firmware verification

*Locate the small hole on the side of the battery cover  
Insert a paper clip or similar into hole, press and release  
Battery system calibrates*

The firmware version will be displayed after reset



### Battery Change

Only use Renata CR-2325 batteries (2 ea.)

Battery cover screw specs: M3/T6 head (4.5mm length)

*Remove the screws and battery cover  
Remove both batteries and note the polarity  
Install 2 new batteries  
Install battery cover, and ensure rubber seal is in correct placement  
Place and tighten screws, using a torque screwdriver set at **0.3 Nm***

*Reset **ECHO** after battery replacement*

All settings and logbook is kept in a non-volatile memory and will not be lost, however time may need to be set again after battery change

**WARNING:** The battery cover and seal must be installed correctly, using correct screws and torque, before any water jumps are made

### Air Filter Change

#### **PRIOR TO A WATER JUMP:**

Make sure the battery screws are tightened to **0.3 Nm** and no foreign objects hinders the working of the cover

The **ECHO** is waterproof to a depth of 5 feet, for 24 hours

If the **ECHO** is submerged into water, allow the unit and air filter to dry in a warm place for 48 hours  
The air filter must be replaced if jumping is to be resumed immediately, or if the air filter is suspected to be contaminated

*Remove the screws and battery cover  
Install new battery cover and ensure rubber seal is in correct placement  
Place and tighten screws using a torque screwdriver set at **0.3 Nm***

*Reset **ECHO** after battery cover replacement*

Air filter, and filter removal tool, are accessories that can be purchased separately



### Trouble Shooting

If the **ECHO** detects an issue, an error symbol is shown (ERR) with a number at the top of the screen


Error codes:

- 1: Transducer defective
- 2: Transducer out of range
- 3: Transducer Time Out too long
- 4: Crystal defective
- 5: Communications error to flash
- 100: Flash defective

*Always restart **ECHO** to attempt to remedy a single ERR code*

*If the ERR code persists, then also perform battery change*

After unsuccessful restart of the **ECHO**, a Factory Reset is necessary:

*Press and hold  during reset, to perform Factory Reset*

**WARNING:** All logbook data will be lost with Factory Reset

If the **ECHO** is still faulty after Factory Reset, it must be serviced by an LB Altimeters Service Center

## Calibration and Maintenance Requirements

Calibration and maintenance by LB Altimeters Service Center is *optional* every 4, 8, and 12 years, following the **ECHO** original date of manufacture

If the **ECHO** exceeds mbar tolerances listed in the Specifications section, and absolute air pressure is required for DZ elevation or offset, calibration can be performed by LB Altimeters Service Center

**NOTE:** When turned **ON** the **ECHO** unit runs a self-test and calibrates to the current ground level, and the **ECHO** will use measured air pressure for altitude calculations  
*The **ECHO** can continue to be used until calibration is possible*

When setting/changing the altitude using the mbar setting via Altitude Offset, the **ECHO** will use absolute air pressure for altitude calculations  
*It is highly recommended the **ECHO** is calibrated by LB Altimeters Service Center before continued use*



## SPECIFICATIONS

### **Mechanical:**

Casing:	Rugged and precision machined aircraft aluminum
Screen glass:	2mm thickness - Hardened glass lens
Dimensions:	64mm x 44mm x 15mm
Weight:	68g
LCD viewing area:	34mm x 29.5mm

**AltiSet II** IrDa compatible: Yes

### **Altitude Adjustment:**

Altitude in mbar offset:	Yes
Altitude mbar offset range:	200 to 1075 mbar (20,67 to 31,74 In Hg)
Present mbar steps:	0.5 mbar
Altitude in feet /meter offset:	Yes
Altitude feet /meter offset range:	-19900 ft. to +19900 ft. (-6000 m to +6000 m)
Present altitude steps:	+/- 10 ft. (5 meters)

### **Tolerances:**

Altitude display:	+/- 1%
mbar:	+/- 1 mbar

### **Factory default settings:**

Feet / meter: Feet

### **Other:**

Operating altitude:	0 to 40,000 ft. (0 to 12,200 m)
Storing Temperature:	-20C to +70C
Operating Temperature Range:	-30C to +60C continuous operation
Will operate at -50C for	10 minutes
Storing Pressure:	200 to 1075 mbar
Maximum allowable humidity:	Up to 99,9% relative humidity
Waterproof:	5 feet for 24 hours
Function Period:	14 hours
Maintenance:	Optional 4, 8 and 12 years, from date of manufacture
Battery type:	2 x Renata CR 2325
L&B part no.:	275727
NATO Stock no.	6675-22-630-2339

### WEEE

Electrical and electronic equipment (EEE) and materials can be dangerous or hazardous to either health or the environment and must be disposed of correctly. Device must not be disposed of as general household waste but must be collected separately.



## WARRANTY

The following conditions apply to the **ECHO** warranty:

If within 12 months of the purchase of **ECHO** a defect or damage is identified by faulty manufacture, LB ALTIMETERS will repair the unit at no cost to the end user

To make a claim under this warranty, send the unit to an authorized dealer or directly to LB ALTIMETERS together with the dated purchase invoice or receipt. The warranty becomes void if damage is caused by external circumstances or if the unit has been serviced or repaired by third parties unauthorized by our national agents or LB ALTIMETERS. All further claims, especially for defects after skydiving accidents, are excluded. LB ALTIMETERS has no obligation to honor any extension of warranty granted by any national agent

## WAIVER OF LIABILITY

The buyer and user of the **ECHO** indemnify the manufacturer and vendor from any liability for damage incurred before, during and after skydiving with the instrument

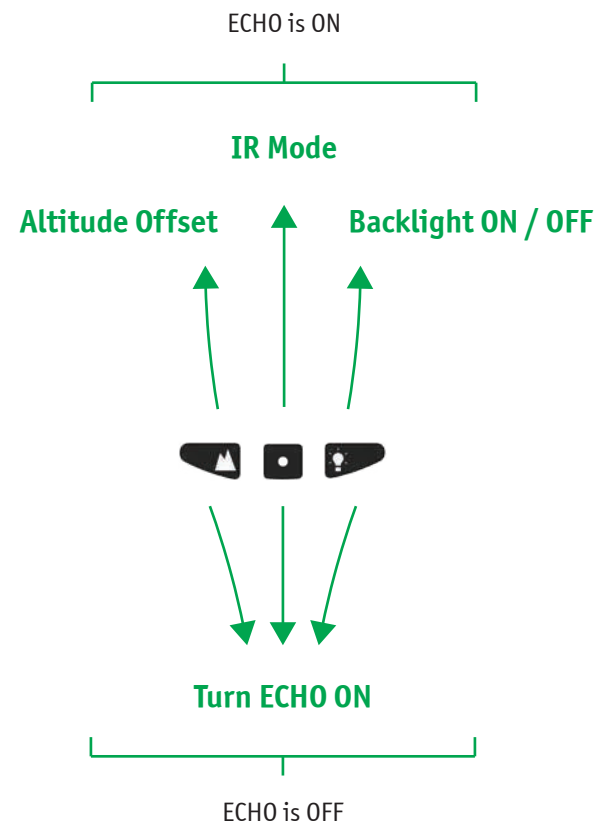


For download and support visit  
[www.LBAltimeters.com](http://www.LBAltimeters.com)

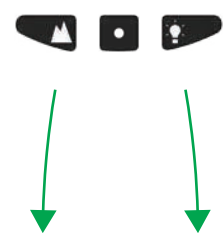
# ECHO - QUICK START & ROAD MAP

## Quick Buttons

Press and hold button for 5 seconds



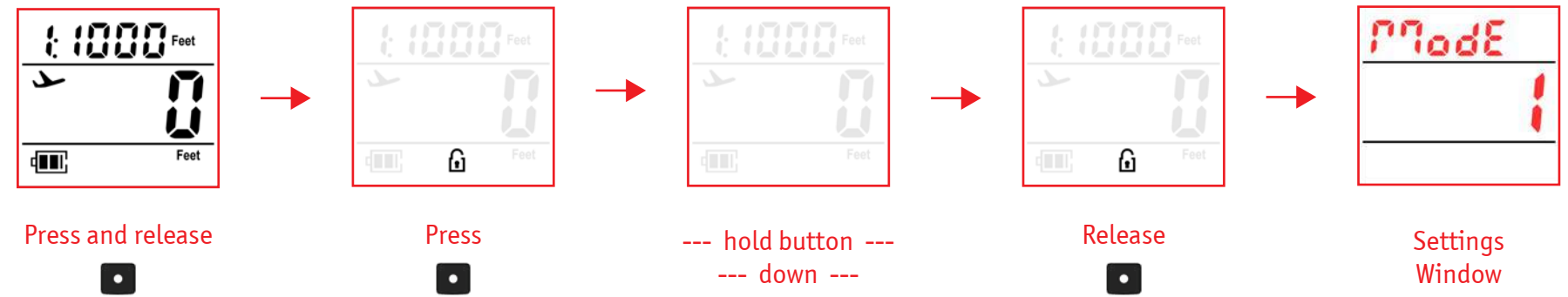
## Warning Display



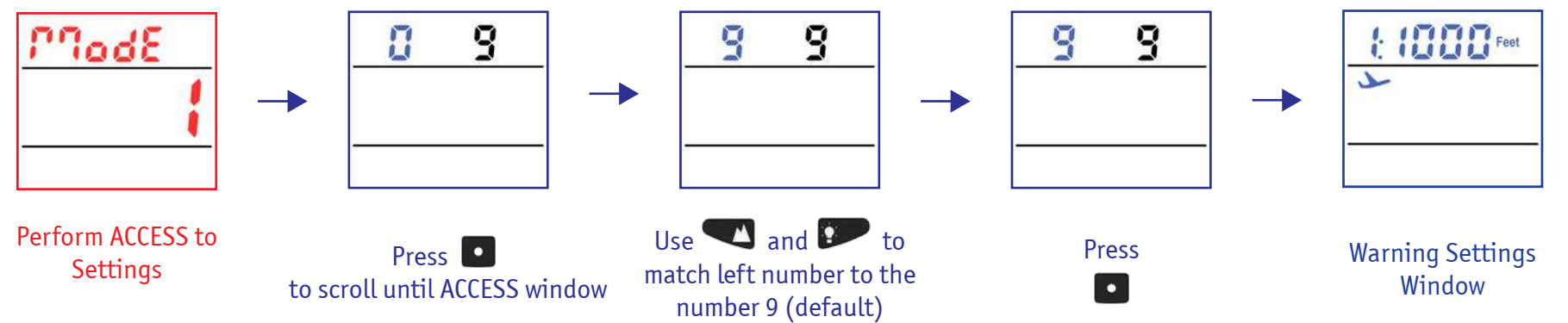
Select previous Warning

Select next Warning

## Performing ACCESS to Settings



## Performing ACCESS to Warning Settings



# ECHO - QUICK START & ROAD MAP

