



# VISO Manual

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Larsen & Brusgaard 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!**

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FAILURE TO FOLLOW ALL WARNINGS, INSTRUCTIONS, AND REQUIRED PROCEDURES MAY RESULT IN SERIOUS INJURY AND DEATH.

Always ensure your altimeter is adjusted to zero prior to jumping to account for any changes in barometric pressure.

Altimeters may give erroneous readings if you are tumbling or the altimeter is in a burble (wake), such as when sit flying or sky surfing. Chest mount altimeters are more vulnerable to this problem. If you are in doubt about how this limitation affects your skydiving, consult a licensed instructor.

DO NOT use this equipment unless you are on, or have passed an approved skydiving course.

Use the VISO™ at your own risk.

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## Introduction

Congratulations on purchasing your new VISO!

The VISO design is based upon the latest findings in microcomputer technology and freefall parameters. Please read ALL of the instructions prior to actual skydiving use.

The VISO comprises three instruments:

### 1 Digital Alti-Meter

Stores detailed altitude information about the last jump for later review

### 2 Digital Speed-Meter

Stores detailed speed information about the last jump for later review

### 3 Jump Counter

Electronic logbook, storing and displaying information about the last 200 jumps.

- Can be used as an aid to track the amount of jumps performed on a rig.
- Can be reset at any time, but time and date for the last reset remains stored and cannot be erased.

## Introduction

### Features

- Digital Alti-Meter or Speed-Meter
- Electroluminescent backlight for night jumping. Can remain ON for several hours
- Automatic calibration to local elevation
- LCD screen for easy and intuitive operation and information review
- Logbook with playback of altitude/speed profile for the last jump
- Operational at sub-zero temperatures
- Switches OFF automatically after 14 hours

### Software & functions

- Stores up to 10 minutes of profile data from last jump  
Displays Alti-Meter and Speed-Meter details from exit to landing
- Records and displays jump information about the last 200 jumps including exit altitude, deployment altitude, freefall time, max. speed in freefall and max. speed under canopy
- Choice of readings in feet or meter and mph or kmh

## Introduction

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If you have any questions please call, fax or e-mail us.

LARSEN & BRUSGAARD




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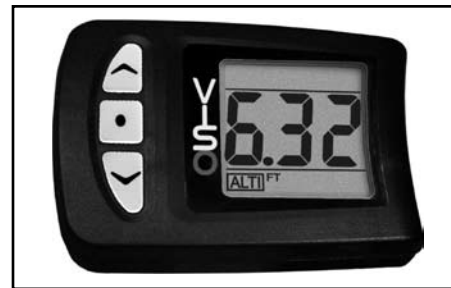
Fax: +45 4648 2490

E-mail: L-and-B@L-and-B.dk

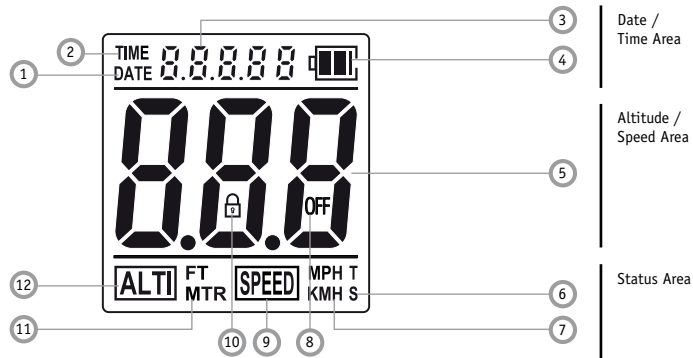
## Description

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1.  UP button
2.  Middle button
3.  Down button
4. LCD display
5. Reset button (on side)



## Display



The display has the following characteristics by default (normal usage):

### Date / Time Area

1 Date icon

## Display

2 Time icon

3 Additional information, displaying:

- current date/time
- time in profile when in Profile Area
- date/time when in Logbook Area

4 Battery status

Battery Power Level icon – indicates the remaining battery capacity

### Altitude / Speed Area

5 Main information, displaying:

- altitude when VISO is set to Alti-Meter mode
- speed when VISO is set to Speed-Meter mode
- detailed profile information when in Profile Area
- logbook information when in Logbook Area
- various setup information

### Status Area

- 6 True Airspeed (TAS) / Skydiver's Airspeed (SAS) status
- 7 Mph / Kmh status
- 8 OFF icon - Used to manually power OFF the VISO
- 9 Speed-Meter indicator when VISO is set to Speed-Meter mode
- 10 Padlock icon Used to indicate and control entrance to ACCESS mode
- 11 Feet/Meter status
- 12 Altimeter indicator when VISO is set to Alti-Meter mode

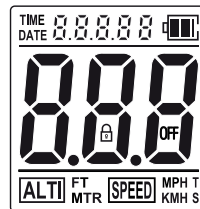
### Power ON

The VISO has been powered OFF prior to shipping from our factory. To turn the power ON, press and hold any key until the VISO beeps, then release the button.

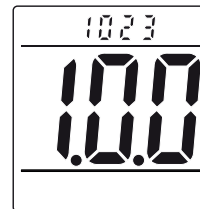
### Auto OFF

The VISO automatically switches OFF 14 hours after the last jump or 14 hours after the last pressing of any key, whichever comes first.

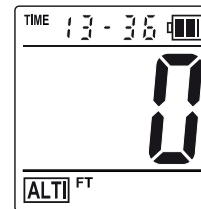
The VISO runs a self-test and displays all icons



It then displays the firmware version number together with a factory reference number...



...and switches to a screen configuration referred to as the "Main Window".



### Main Window

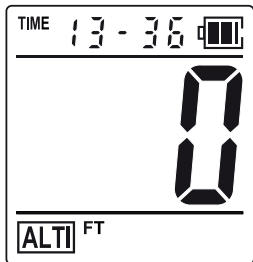
This represents the starting point for all further actions and subsequent displays.

## Main Window

### Explanation

The Main Window is the default window which displays current time, battery status and either Altitude or Speed.


### Alti-Meter Mode



When the VISO is set to Alti-Meter mode, the “ALTI” and “Feet/Meter” icons are ON.

The VISO will display the altitude during climb, in freefall and under canopy.

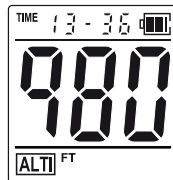
The date/time information switches OFF during freefall and under canopy.

(When preset, press  to view the current date).

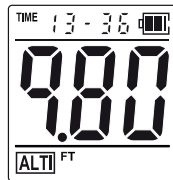
## Main Window

### Alti-Meter Displays

In Alti-Meter mode the LCD may show 3 different displays, depending on what altitude value is shown.



If the altitude is below 1000 the altitude is displayed as normal. Altitude resolution is in 10 feet (5 meter) increments.



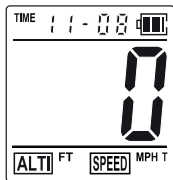
If the altitude is 1000-9999, the altitude is displayed as tens of feet or meter. Altitude resolution is in 10 feet (10 meter) increments





If the altitude is 10000 or higher, the altitude is displayed as hundreds of feet or meter. Altitude resolution is in 100 feet (100 meter) increments.

### Speed-Meter Mode



When the VISO is set to Speed-Meter mode, the “ALTI”, “Feet/Meter”, “Mph/Kmh” and “TAS/SAS” icons are ON.

**Note:** *The VISO will display the altitude during climb and switch to Speed-Meter during the freefall and under canopy. Date/Time area switches OFF during the freefall and under canopy.*

### Speed-Meter Display during the freefall



Speed resolution is in 1 Mph (1 Kmh) increments.

### Important Notice about Speed Recordings

Experience has shown that when mounting the VISO on the hand or belly, different air pressures induced by hand or body movements may result in incorrect recordings of speeds.

## Road Map

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It is recommended that you first familiarize yourself with the **VISO ROAD MAP** which is a very helpful tool when using the VISO for the first time. The **ROAD MAP** comprises four areas:

- Backlight Setup Area (see page 39)
- Profile Area (see page 51)
- Setup Area (see page 19)
- Logbook Area (see page 43)

## VISO Settings

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The VISO can be customised to your personal settings. Your settings will be stored and recalled also after replacing batteries. When you first get the VISO, we recommend you to go through the **SETUP Selector** to customise the VISO settings. SETUP Selector

In the Setup Area the following options can be selected:




- Alti-Meter/Speed-Meter
- Feet/Meter when set to Alti-Meter
- Mph/Kmh when set to Speed-Meter
- Altitude offset
- Dive Type
- True Airspeed (TAS) / Skydiver's Airspeed (SAS)
- Set current year
- Set current date
- Set current time

- Preset jump counter
- Reset jump counter
- Turn the VISO OFF
- Padlock window

### To enter the Setup Area

Perform ACCESS on  or  or . Then hold  > 5 seconds

### Performing ACCESS:




- 1 Press  or  or  and release quickly. The padlock icon turns ON and OFF
- 2 When the padlock icon turns ON again, immediately press the same button and keep it pressed (padlock turns OFF)
- 3 When the padlock icon turns ON again, release immediately

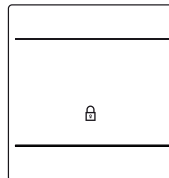
### General note:

*The VISO goes out of ACCESS and back to the Main Window if no button has been pressed within 15 sec.*

*ALL functions (except Power ON) can be performed ONLY when the VISO is in ACCESS mode.*

### To leave the Setup Area

Wait until the display times out, or press  repeatedly until the Padlock window shows. Then press  or  to exit.



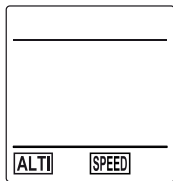
Padlock Window



### Alti-Meter / Speed-Meter Selector

Alti-Meter/Speed-Meter • Feet/Meter when set to Alti-Meter • Mph/Kmh when set to Speed-Meter • Altitude offset • Dive Type • True Airspeed (TAS)/ Skydiver's Airspeed (SAS) • Set current year • Set current date • Set current time • Preset jump counter • Reset jump counter • Turn the VISO OFF • Padlock window


### Alti-Meter / Speed-Meter

The VISO can be set to function either as an Alti-Meter or as a Speed-Meter.



Press  or  to toggle between Alti-Meter or Speed-Meter mode.

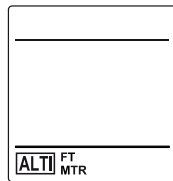
The active selection flashes.

Press  to save setting and enter the **Feet/Meter** selector.

### Feet/Meter Selector


Alti-Meter/Speed-Meter • **Feet/Meter when set to Alti-Meter** • Mph/Kmh when set to Speed-Meter • Altitude offset • Dive Type • True Airspeed (TAS)/ Skydiver's Airspeed (SAS) • Set current year • Set current date • Set current time • Preset jump counter • Reset jump counter • Turn the VISO OFF • Padlock window

### Feet/Meter



Press  or  to toggle between Feet/Meter.

The active selection flashes.

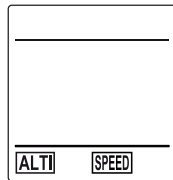
Press  to save setting and enter the **Mph/Kmh** selector.

**Note:** Jump data is continuously stored in both feet and meter.  
At any time stored information may be displayed in either unit of measurement by selecting the respective mode.

### Mph/Kmh Selector


Alti-Meter/Speed-Meter • Feet/Meter when set to Alti-Meter • **Mph/Kmh when set to Speed-Meter** • Altitude offset • Dive Type • True Airspeed (TAS)/ Skydiver's Airspeed (SAS) • Set current year • Set current date • Set current time • Preset jump counter • Reset jump counter • Turn the VISO OFF • Padlock window

### Mph/Kmh



Press  or  to toggle between Mph/Kmh.

The active selection flashes.

Press  to save setting and enter **Altitude Offset**.

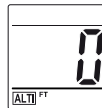
**Note:** Jump data is continuously stored in both Mph and Kmh. At any time stored information may be displayed in either unit of measurement by selecting the respective mode.

### Altitude Offset



Alti-Meter/Speed-Meter • Feet/Meter when set to Alti-Meter • Mph/Kmh when set to Speed-Meter • **Altitude offset** • Dive Type • True Airspeed (TAS)/ Skydiver's Airspeed (SAS) • Set current year • Set current date • Set current time • Preset jump counter • Reset jump counter • Turn the VISO OFF • Padlock window


### Explanation

If the DZ landing elevation differs from that of the aircraft take off elevation, offset the VISO prior to entering the aircraft as follows:



### Altitude Offset

Press and hold  or  to offset the current altitude.

Press  to save setting and enter the **Dive Type** selector.

**Note:** When performing altitude offset, the VISO enters Jump Mode and the altitude offset will be retained for 5 hours, if no jump is made. After 5 hours the VISO recalibrates to the field elevation where it is currently located. The altitude offset is not retained when the VISO is powered OFF.

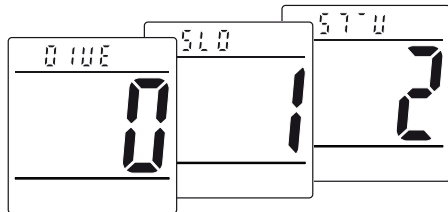
### Dive Type Selector


Alti-Meter/Speed-Meter • Feet/Meter when set to Alti-Meter • Mph/Kmh when set to Speed-Meter • Altitude offset • **Dive Type** • True Airspeed (TAS)/ Skydiver's Airspeed (SAS) • Set current year • Set current date • Set current time • Preset jump counter • Reset jump counter • Turn the VISO OFF • Padlock window


#### Explanation


The Dive Type mode can be used to change parameters when the VISO detects free-fall exit and canopy deployment.

### Dive Type



Press  to scroll forward through the dive type list.

Press  to scroll backward through the dive type list.

Press  to save setting and enter the **TAS/SAS** Selector.

0 = ---- (blank, factory default parameters)

1 = SLO (Slow) \*

2 = STU (Student) \*\*

#### \* Dive Type, 1: SLO (Slow)

In SLO the exit fall rate and deployment calculation parameters are changed to fit very slow falling types of dives, like wing suit dives, etc.

#### \*\* Dive Type, 2: STU (Student)

In STU the descent rate parameters are changed to allow detection of short freefalls, (2 sec).

### **True Airspeed (TAS) / Skydiver's Airspeed (SAS)**

Alti-Meter/Speed-Meter • Feet/Meter when set to Alti-Meter • Mph/Kmh when set to Speed-Meter • Altitude offset • Dive Type • **True Airspeed (TAS) / Skydiver's Airspeed (SAS)** • Set current year • Set current date • Set current time • Preset jump counter • Reset jump counter • Turn the VISO OFF • Padlock window

#### Explanation

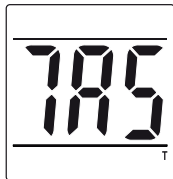
**True Airspeed (TAS)** and **Skydiver's Airspeed (SAS)** are two methods of calculating the airspeed of a moving/flying/falling object.



**TAS** is a term used in aviation: It is the speed of an object relative to the surrounding air, regardless of the altitude.

**SAS** is a new concept developed by LARSEN & BRUSGAARD: **SAS** is the speed of a skydiver calculated from measurements of air pressure and temperature and converted to a fixed air pressure (875.3 mb) and a fixed temperature (+7.080C) which corresponds to 4,000 feet ASL.


*See separate section on page 60 for more information about TAS and SAS.*

### True Airspeed (TAS) / Skydiver's Airspeed (SAS)



Press  or  to toggle between TAS and SAS.

The active selection flashes.

Press  to save setting and enter the **Set Current Year** selector.

**NOTE:** *Jump data is continuously stored in both TAS and SAS. Stored information may be displayed in either unit of measurement by selecting the respective mode.*

#### Recommendation:

When using the VISO as a Speed-Meter in a big way base it is recommended to set it to SAS.

SAS will show the same speed throughout the dive (at the

same body position), whereas TAS will show a different speed throughout the dive (the same body position, different air density).

Below are some recommendations and numbers for SAS:

A good base speed should be: 110-115 mph.

A high base speed should be: 120-125 mph (tendency to wobble when docking).

A slow base speed should be: 100-105 mph (jumpers start to go low).

*See separate section on page 60 for more information about TAS and SAS.*





### Set Current Year Selector


Alti-Meter/Speed-Meter • Feet/Meter when set to Alti-Meter • Mph/Kmh when set to Speed-Meter • Altitude offset • Dive Type • True Airspeed (TAS)/ Skydiver's Airspeed (SAS) • **Set current year** • Set current date • Set current time • Preset jump counter • Reset jump counter • Turn the VISO OFF • Padlock window



#### Set Current Year

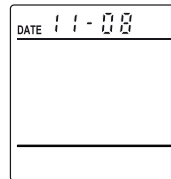
Press  to increase year.

Press  to decrease year.


Press  to save setting and enter the **Set Current Date** selector.


### Set Current Date Selector


Alti-Meter/Speed-Meter • Feet/Meter when set to Alti-Meter • Mph/Kmh when set to Speed-Meter • Altitude offset • Dive Type • True Airspeed (TAS)/ Skydiver's Airspeed (SAS) • Set current year • **Set current date** • Set current time • Preset jump counter • Reset jump counter • Turn the VISO OFF • Padlock window



#### Set Current Date

Press  to increase date.

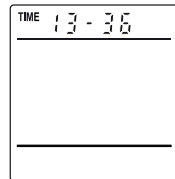
Press  to decrease date.

Press  to save setting and enter the **Set Current Time** selector.


**Note:** Date format is MM:DD.


### Set Current Time Selector


Alti-Meter/Speed-Meter • Feet/Meter when set to Alti-Meter • Mph/Kmh when set to Speed-Meter • Altitude offset • Dive Type • True Airspeed (TAS)/ Skydiver's Airspeed (SAS) • Set current year • Set current date • **Set current time** • Preset jump counter • Reset jump counter • Turn the VISO OFF • Padlock window



#### Set Current Time

Press  to increase time.

Press  to decrease time.

Press  to save setting and enter the **Preset Jump Counter** selector.

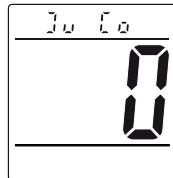
**Note:** Time format is HH:MM and in 24-hour format

### Preset Jump Counter Selector


Alti-Meter/Speed-Meter • Feet/Meter when set to Alti-Meter • Mph/Kmh when set to Speed-Meter • Altitude offset • Dive Type • True Airspeed (TAS)/ Skydiver's Airspeed (SAS) • Set current year • Set current date • Set current time • **Preset jump counter** • Reset jump counter • Turn the VISO OFF • Padlock window


#### Explanation


The VISO can store up to 200 jumps in the logbook and numbers them starting from the jump number that you preset here. The counter can be used to keep track on the number of jumps and it can be reset at any time, but time and date for the last reset remains stored and cannot be erased.



#### Preset Jump Counter

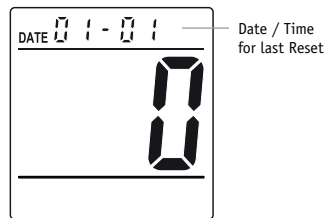
Press  to increase the jump counter.

Press  to decrease the jump counter.

Press  to save setting and enter the **Reset Jump Counter** selector.

### Reset Jump Counter Selector

Alti-Meter/Speed-Meter • Feet/Meter when set to Alti-Meter • Mph/Kmh when set to Speed-Meter • Altitude offset • Dive Type • True Airspeed (TAS)/ Skydiver's Airspeed (SAS) • Set current year • Set current date • Set current time • Preset jump counter • **Reset jump counter** • Turn the VISO OFF • Padlock window



### Reset Jump Counter

Press AND at the same time for more than 10 seconds to reset the Jump Counter and delete the entire logbook.

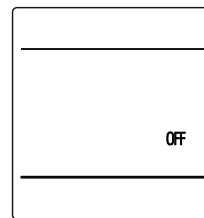
Date and Time for the last reset is displayed together with the number of resets which have been made.

Press to enter the **Turn VISO OFF** selector

**Note:** Date, Time and the number of resets which have been made are stored and there is no way to clear it. **There is no way to restore the logbook information!**

### Turn VISO OFF Selector

Alti-Meter/Speed-Meter • Feet/Meter when set to Alti-Meter • Mph/Kmh when set to Speed-Meter • Altitude offset • Dive Type • True Airspeed (TAS)/ Skydiver's Airspeed (SAS) • Set current year • Set current date • Set current time • Preset jump counter • Reset jump counter • **Turn the VISO OFF** • Padlock window



### Turn VISO OFF

Press AND at the same time and hold until the VISO turns OFF.

Or, press to enter the **Padlock window**.

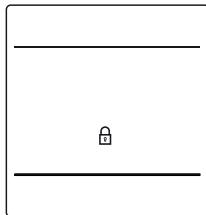
We recommend that you switch OFF the VISO when traveling on commercial flights and when driving in mountainous areas.

**Note:** When switched OFF the VISO cannot be used for jumping. Customer settings are not lost when switched OFF.



To power the VISO ON, see page 12.


### Padlock Window

Alti-Meter/Speed-Meter • Feet/Meter when set to Alti-Meter • Mph/Kmh when set to Speed-Meter • Altitude offset • Dive Type • True Airspeed (TAS)/ Skydiver's Airspeed (SAS) • Set current year • Set current date • Set current time • Preset jump counter • Reset jump counter • Turn the VISO OFF • **Padlock window**



### Padlock Window

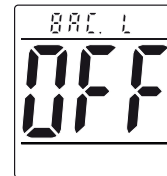
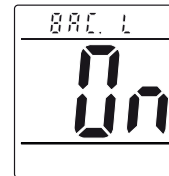
Press  or  to leave the Setup Area and return to the Main Window.

Or, press  to return to Alti-Meter/Speed-Meter selector.



## Backlight Setup Area

Perform ACCESS on  to enter the **Backlight Setup Area**




(Performing ACCESS, see page 20)



### Backlight ON/OFF

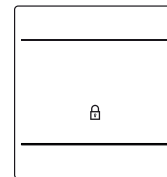
Press  or  to toggle between backlight ON/OFF

### To leave the Backlight Setup Area

Wait until the display times out. Or, press  to enter the Padlock window and then press  or  to return to the Main Window.

**Note:** Backlight is specifically for night jumps.

### Padlock Window



## Backlight Setup Area

---

**Note:** *If the backlight is turned ON while the VISO is **not** in Jump Mode, the backlight will automatically turn OFF after 30 minutes, if still not in Jump Mode.*

*If the backlight is turned ON while the VISO **is** in Jump Mode, the backlight will remain ON until the unit goes out of Jump Mode.*

(Jump Mode see page 42)

## Zeroing the VISO

---

### Explanation

The VISO continuously adjusts itself to the local elevation and displays 0 FT (MT) in the Altitude/Speed area. If the Altitude/Speed area does not display “0” prior to jumping, the unit has not yet adjusted itself to the local elevation and it must be manually zeroed.

To manually zero the unit either perform reset or turn the unit OFF and then ON.

(Perform reset, see page 55)

(Turn OFF the unit, see page 37)

## Jump Mode

Shortly after takeoff the VISO switches to Jump Mode and displays the altitude in the Altitude/Speed area.

- When the VISO is set to Alti-Meter, the ALTI and Feet/Meter icons are ON and it will display the altitude during climb, during the freefall and under canopy.
- When the VISO is set to Speed-Meter, the ALTI, SPEED, Feet/Meter, Mph/Kmh and TAS/SAS icons are ON.

**Note:** When set to Speed-Meter, the VISO will display the altitude during climb and switch to Speed-Meter during the freefall and under canopy.

## Jump Data








After landing the jump data can be displayed on the LCD by accessing the **Logbook Area** and **Profile Area**.

### Logbook Area

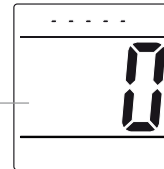
Explanation: The logbook can store up to 200 jumps, and be reset at any time. It is not possible to delete a single jump.

Perform ACCESS on  to enter the **Logbook Area** (Performing ACCESS, see page 20)

In the **Logbook Area** press  to display,

- |  |   |
|--|---|
|  Jump number            |  Max. speed under canopy |
|  Exit altitude          |  Padlock window          |
|  Deployment altitude    |   |
|  Freefall time          |   |
|  Max. speed in freefall |   |

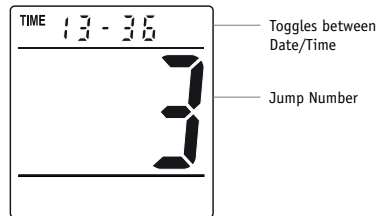
Display when logbook is empty



### Jump Number

**Jump number** • Exit altitude • Deployment altitude • Freefall time • Max. speed in freefall • Max. speed under canopy • Padlock window

### Jump Number



Press or to scroll in the jumps. Date/Time information will switch accordingly in the “Date/Time Area”. Press to go to **Exit Altitude** information.

### Exit Altitude

Jump number • **Exit altitude** • Deployment altitude • Freefall time • Max. speed in freefall • Max. speed under canopy • Padlock window

### Exit Altitude



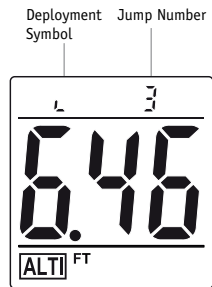
Press or to scroll in Exit Altitudes. Press to go to **Deployment Altitude** information.

**Note:** The LCD may show 3 different displays, depending on what altitude value is shown. See page 14.

### Deployment Altitude

Jump number • Exit altitude • **Deployment altitude** • Freefall time • Max. speed in freefall • Max. speed under canopy • Padlock window

### Deployment Altitude



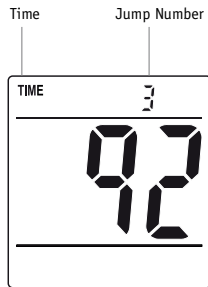
Press or to scroll in Deployment Altitudes.  
Press to go to **Freefall Time** information.

**Note:** The LCD may show 3 different displays, depending on what altitude value is shown. See page 14.

### Freefall Time

Jump number • Exit altitude • Deployment altitude • **Freefall time** • Max. speed in freefall • Max. speed under canopy • Padlock window

### Freefall Time



Press or to scroll in Freefall Times.  
Press to go to **Max Speed in Freefall** information.



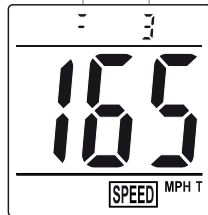
### Max. Speed in Freefall

Jump number • Exit altitude • Deployment altitude • Freefall time • **Max. speed in freefall** • Max. speed under canopy • Padlock window

### Max. Speed in Freefall

Max. Freefall  
Speed Symbol

Jump Number



TAS/SAS

Press or to scroll in Max Speed in Freefall.

Press to go to **Max Speed under Canopy** information.

**Note:** In the lower right hand corner of the display a "T" or an "S" will indicate whether the VISO is set to "TAS" or "SAS".

For more information about TAS and SAS, see page 60.

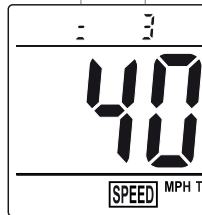
### Max. Speed under Canopy

Jump number • Exit altitude • Deployment altitude • Freefall time • Max. speed in freefall • **Max. speed under canopy** • Padlock window

### Max. Speed under Canopy

Max. Freefall  
Speed Symbol

Jump Number



TAS/SAS

Press or to scroll in Max Speed under Canopy.

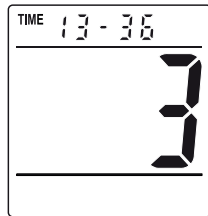
Press to go to the **Padlock window**.




## Logbook Area

### Padlock Window

Jump number • Exit altitude • Deployment altitude • Freefall time • Max. speed in freefall • Max. speed under canopy • **Padlock window**

### Padlock Window




Press  or  to leave the Logbook Area and return to the Main Window, or press  to **return to Logbook Area**.

## Profile Area


### Explanation


The **Profile Area** features playback of altitude/speed profile for the last jump.

**Note:** Speed information is available in playback mode, after freefall has lasted w6 sec.


Perform ACCESS on  to enter the **Profile Area**.

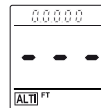
(Performing ACCESS, see page 20)

In the **Profile Area** press  to display,

 Altitude playback information

 Padlock window

 Speed playback information



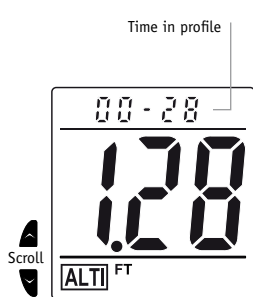
Display when Profile Area is empty (no jumps stored)

## Profile Area

### Playback Altitude Versus Time

Playback altitude versus time • Playback speed versus time • Padlock Window

### Playback Altitude Versus Time



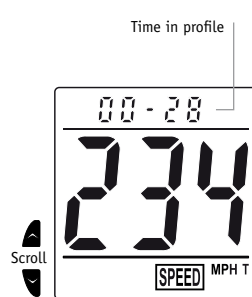
- Press to playback the altitude profile at 1/4 speed
- Press twice to playback in real time
- Press three times to playback at 2x speed
- Press four times to playback at 5x speed
- Press to playback the altitude profile in reverse at 1/4 speed
- Press twice to playback in reverse in real time
- Press three times to playback in reverse at 2x speed
- Press four times to playback in reverse at 5x speed
- Press to stop playback
- Press or to resume playback or press to go to **Playback Speed Versus Time.**

## Profile Area

### Playback Speed Versus Time

Playback altitude versus time • **Playback speed versus time** • Padlock Window

### Playback Speed Versus Time



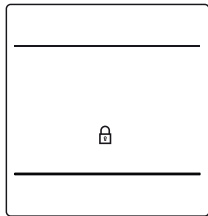
- Press to playback the speed profile at 1/4 speed
- Press twice to playback in real time
- Press three times to playback at 2x speed
- Press four times to playback at 5x speed
- Press to playback the speed profile in reverse at 1/4 speed
- Press twice to playback in reverse in real time
- Press three times to playback in reverse at 2x speed
- Press four times to playback in reverse at 5x speed
- Press to stop playback
- Press or to resume playback or press to go to **Padlock window.**

### Important Notice about Speed Recordings




Experience has shown that when mounting the VISO on the hand or belly, different air pressures induced by hand or body movements may result in incorrect recordings of speeds. For more information about using the VISO as a Speed-Meter, see page [?](#).

### Padlock Window

Playback altitude versus time • Playback speed versus time • **Padlock Window**



### Padlock Window

Press  or  to leave the **Profile Area** to return to the Main Window or press  to return to the **Profile Area**.

## Resetting the VISO



Press a paperclip into the tiny hole on the side of the unit and release. The unit restarts.

After battery replacement or resetting, the battery system requires 2 minutes to calibrate itself before displaying the correct status.

While calibrating, the battery icon toggles between full and low.

**Note:** Reset the unit after battery replacement, when troubleshooting and when verifying software version number.

## Battery Replacement



Carefully slide out battery holder and remove batteries. Install new batteries using the correct polarity. Use only CR-2325.

After battery replacement or resetting, the battery system requires 2 minutes to calibrate itself before showing the correct status.

While calibrating, the battery icon toggles between full and low.

**Note:** Customer settings are not lost when removing batteries. However, the built-in clock may need to be reset to the current time.

## Battery Status



Full capacity: Symbol shows two black bars inside the battery icon.



Half capacity: Symbol shows one black bar inside the battery icon.



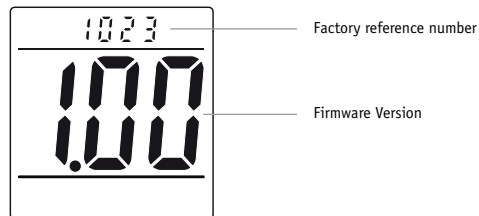
Low capacity: Symbol shows no black bars, just an “empty” battery icon. Batteries should be replaced as soon as possible. The “**Low bat**” flashes once every 15 sec.

**Caution:** Do not make night jumps at sub zero temperatures when bat. shows low capacity.



Empty batteries: The battery icon flashes. Replace batteries immediately.

## Firmware Version



Perform reset or turn the unit OFF and then ON.

The VISO runs a self-test and displays all icons.

The unit then displays the firmware version together with a factory reference number.


(Performing reset, see page 55)

## Trouble-shooting

When the VISO detects a fault, an error (“ERR”) symbol and trouble shooting numbers 2 to 5 and 100 are displayed in the upper part of the screen. At the same time the unit beeps every minute.

The “ERR” trouble shooting codes are as follows: ERR 2 (transducer defective), ERR 3 (transducer out of range), ERR 4 (crystal defective), ERR 5 (comm. error to flash), ERR 100 (flash defective). Remedy: Perform reset.

(Performing reset, see page 55)

If the unit still does not function correctly even after replacing the batteries and performing reset, perform following: Press and hold  while resetting. The VISO resets to factory settings and sounds three beeps.

If the unit is still faulty, please contact your local dealer or LARSEN & BRUSGAARD.

## APPENDIX

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### TAS and SAS

#### Definitions

**True Airspeed (TAS)** and **Skydiver's Airspeed (SAS)** are two methods of calculating the airspeed of a moving/flying/falling object.

TAS is a term used in aviation: It is the speed of an object relative to the surrounding air, regardless of the altitude.

SAS is a new concept developed by LARSEN & BRUSGAARD: **SAS** is the speed of a skydiver calculated from measurements of air pressure and temperature and converted to a fixed air pressure (875.3 mb) and a fixed temperature (+7.080C) which corresponds to 4,000 feet ASL.

**TAS.** A skydiver's True Airspeed (TAS) relative to the ground changes as a function of the altitude (air pressure) and temperature which makes it difficult to compare fall-rates.

## APPENDIX

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Example: A skydiver (in a fixed freefall position) who has a terminal fall rate of 62 meters/sec at 10,000 feet will have a terminal fall rate of 50 meters/sec at 3,000 feet.

It will be seen that the difference in altitude (air pressure) makes it difficult to compare the fall-rates when measured using TAS.

**SAS.** The SAS formula calculates airspeed (using the same metrics used with TAS) as though the complete skydive had been performed at a fixed air pressure and a fixed temperature which corresponds to 4,000 feet ASL. 4,000 feet is chosen as the reference altitude by LARSEN & BRUSGAARD since this is the average altitude at which the working time of a skydive is normally ended.

#### Conclusion

Using **SAS**, skydivers in any body position can express their vertical speed by a number (**SAS**). This number remains virtually constant regardless of altitude with

little or no variance due to temperature differences and can be compared with the airspeeds of other skydivers.

This means that regardless of the elevation of the DZ you are jumping at, **SKYDIVER'S AIRSPEED (SAS)** will be the same for the same body position.

SAS is very useful when doing big formation skydiving. If using TAS, it will seem like the base is slowing down the fall rate during the entire skydive.

For information about using the VISO as a Speed-Meter, see page 16.

### Mechanical

Dimensions:	81 x 69 x 23 mm (3 1/8" x 2 3/4" x 3/4")
Weight:	90 g (3.9 oz)
LCD area:	5.5 cm <sup>2</sup> (0.9 inch <sup>2</sup> )

### Logbook

Maximum jumps:	200
Logbook information:	Exit altitude Deployment altitude Freefall time Max. speed in freefall Max. speed under canopy



## SPECIFICATIONS

Tolerances:	Exit altitude: +/- 1.2%
	Deployment altitude: +/- 1.2%
	Freefall time: +/- 1 sec
	Speed (TAS/SAS): +/- 3 mph (+/- 5 kmh)

### Profile Storage

Continued storage of last jump

Maximum logging time:	10 minutes
Sampling rate:	4/sec.
Maximum logging altitude:	39,999 feet (12,191 m)

### Factory default settings

Mode	Alti-Meter
Feet / Meter:	Feet
Mph / Kmh:	Mph

## SPECIFICATIONS

TAS / SAS:	TAS
Type of Dive:	0
Date:	2006:01:01 (year, month, date)
Time:	12:00:00 (hours, minutes, seconds)

### Other

Present altitude:	+/- 10 ft
Operating altitude:	0 to 40,000 ft (0 to 12,191 m)
Clock:	+/- 4 min/month
Operating Temperature Range:	-30C to +60C (-22F to +140F)
Battery type:	CR 2325
Battery Life Time (at normal use):	approximately 2 years
L&B part no.:	205441
NATO Stock no.:	6605-22-613-6341

## Accessories

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For information about VISO accessories, please visit [www.L-and-B.dk](http://www.L-and-B.dk)

## Warranty

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The following conditions apply to the VISO™ warranty:

If within 12 months of the purchase of VISO™ a defect or damage is identified by faulty manufacture, LARSEN & BRUSGAARD 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 LARSEN & BRUSGAARD 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 LARSEN & BRUSGAARD.

All further claims, especially for defects after skydiving accidents, are excluded.

LARSEN & BRUSGAARD has no obligation to honor any extension of warranty granted by any national agent.

### Waiver of Liability

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

