

Bräuniger IQ-ONE

IQ-ONE + *with flight recorder*



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Operating Philosophy

Bräuniger GmbH's philosophy is to produce user-friendly instruments.

A quick press of each key lets you access the main functions of the instrument. Hold a key down for about three seconds to call up **Set-Mode** for that function. From there, a further three-second press will call up **Option-Mode** for that key.

In Set-Mode and Option-Mode, the keys labeled *START/STOP/RESET* and *CLEAR-ALT* become Arrow Keys. With these you can change the display fields, which flash to indicate they are changeable. After making changes in Set-Mode, use a short press to return to Run-Mode or wait three seconds.

Run-Mode

During normal use the instrument is in **Run-Mode**. In this mode the instrument shows sink or climb rate, airspeed (if the optional sensor is plugged in) and/or temperature, altitude, altitude difference, time, battery condition and the activated acoustic signals.

When in this mode, all the main functions can be called up by briefly pressing the keys.

- volume of the acoustic signal (main Variometer)
- ON/OFF of the sink warning alarm (main sink alarm warning)
- change of height displays (main altimeter)
- reset height difference (main altimeter)
- START/STOP of stop watch (main time functions)
- change between TIME-CHRONO and MEMO displays (main time functions)

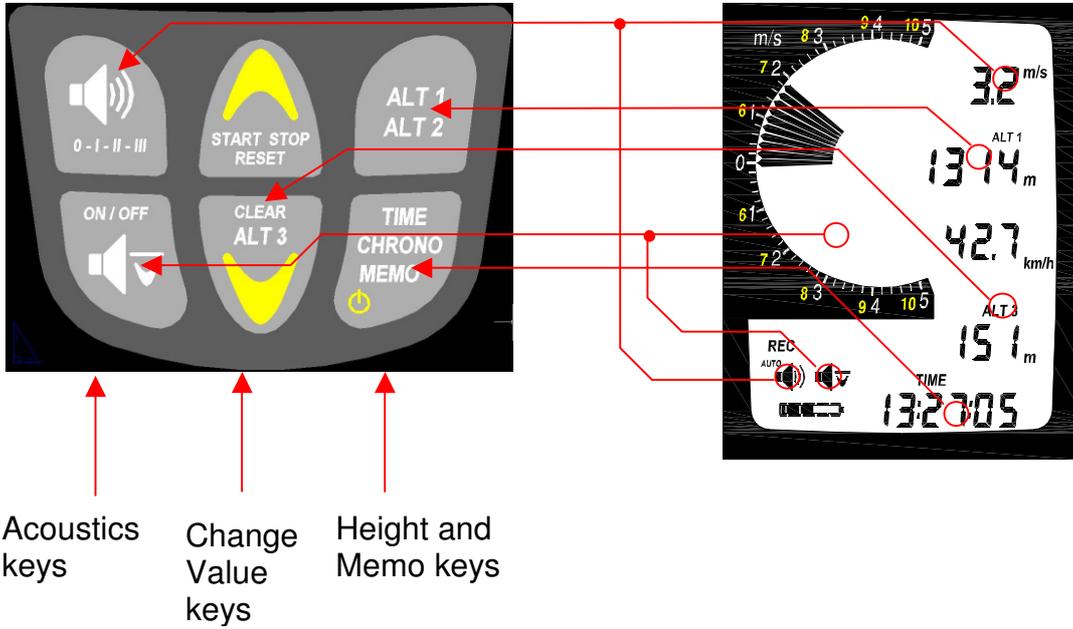
Set-Mode

To enter Set-Mode for a given key, press and hold the key for about three seconds; *SET* will appear in the lower portion of the display. The relevant display field will flash and can be altered with the Arrow Keys. After making your changes, either wait three seconds or use a short press to return to Run-Mode. A three-second press when in Set-Mode will take you to Option-Mode.

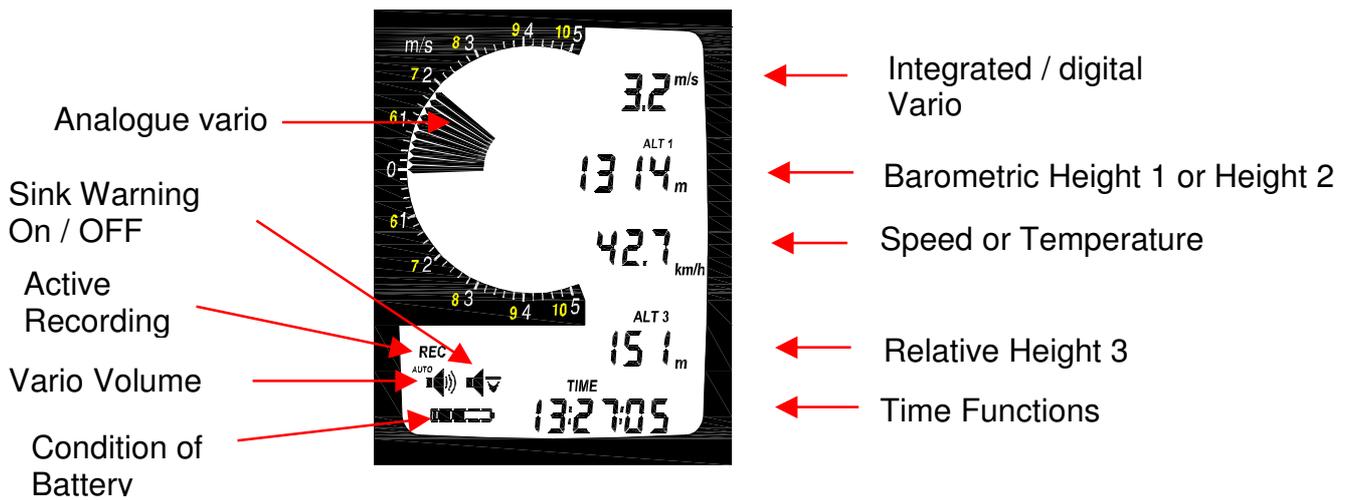
Option-Mode

When in Set-Mode, press the same key again for three seconds to bring the instrument into Option-Mode; *OPT* will appear in the lower portion of the display. Here you can change the settings of various values (see more details below). Again, the relevant field will flash and can be altered with the arrow keys. Use a short press to keep your changes and go on to the next option; when you reach the last option a short press will cycle the instrument back to the first option. When you are finished setting the options, wait three seconds to return to Run-Mode.

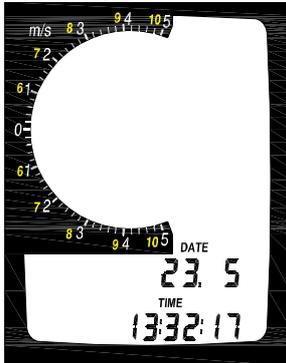
Key Functions



Elements of the Display



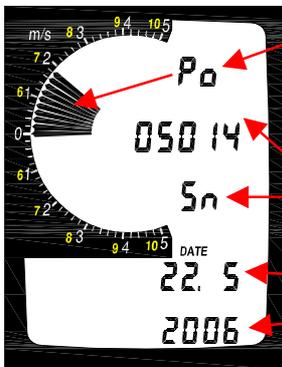
Switching the Instrument ON/OFF



← Date

← Time

The date and time are displayed when the instrument is off. To turn it on, press and hold the *TIME/CHRONO/MEMO* Key until you hear a beep, and then release it. After a short display test you will see the Start up Screen.



Battery condition

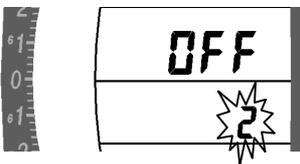
5= full
0= empty

Internal Serial number

Day, month
and year

The Startup Screen shows the serial number, the battery condition and the date. The analog scale on the left shows the battery charge.

Switching Off



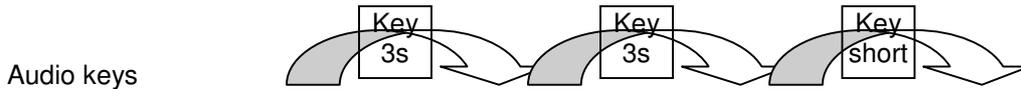
To switch the instrument *OFF* without setting the time, Press and hold the *TIME/CHRONO/MEMO* Key for about seven seconds.

During the shutdown process, the Set Menu for time will appear – unless a barogram was recorded for the current flight [Model 6010 only]. **Continue to hold the key down** while the instrument counts down from 3 to 1. You will hear a beep and see *OFF* appear on the display when the process is complete.

Quick Operating Instructions

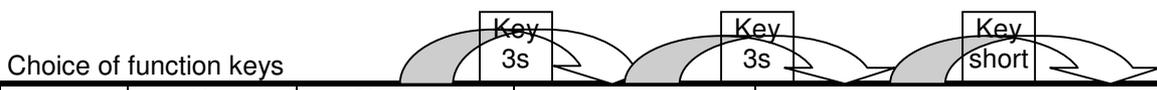
Quick operating instructions – direct choice keys

	Quick touch in RUN mode	Long hold in RUN mode	Functions in SET mode	Functions in OPTION mode
	CHRONO Start -Stop	Reset CHRONO when running in CHRONO	Change up	Choice/change up
	Clear ALT 3		Change down	Choice/change down

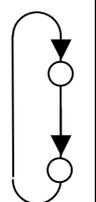


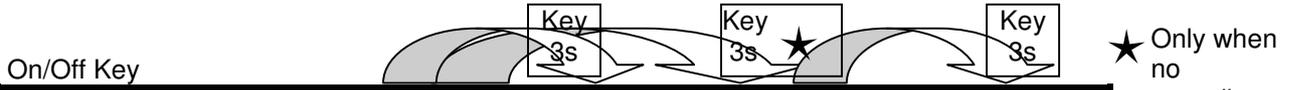
Audio keys

	Key	Audio change	Set	Option					
Direct choice		Volume 6 levels	A-Int Basic damping 1,2,3,4	Unit VARIO m/s, ft/min- x100	d-Int Integra- tion time 1 to 30 s	Audio Audio starting point 0.02...0.4 m/s	Audio Pitch Max. at about 3 to 11 m/s	ASI On/Off	
		Sink alarm On/Off	Audio Sink alarm setting Setting point with keys ▲▼	Unit TEMP °C, °F	Corr Temp Correct Sensor -8.0 to +7.9	Unit Speed km/h, kts, mph	StALL Stall speed	Corr SPEED Correct Speed 50..100.. 150	SPEED diSP Change speed display Temp 4s, Speed 30s, 60s, 120s, ∞

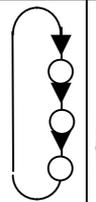


Choice of function keys

	Key	Choice of function	Set	Option		
		ALT 1	Altitude setting ALT 1	Unit Alti 1 m, ft	Unit Pressure units QNH hPa, inHg	Corr Sensor correction -47.9 to 47.9
		ALT 2	Altitude setting ALT 2	Unit ALT2 (m/ft)	REL/AbS Mode A2	



On/Off Key

	Key	Choice of function key	Off	Set	Option
		TIME	Off with confirmation	Time, Year, Date	Date format 12/24
		CHRONO	Off with confirmation		
		MEMO	Off with confirmation	Clear Memo with confirmation CL	

★ Only when no recording is active

The Altimeter

General

How does an altimeter function?

An altimeter is really a barograph because it doesn't directly measure height, but air pressure. Height is calculated from changes in air pressure. The pressure at sea level is used as zero height for the calculation of real height (after the international height formula).

Why does pressure change with height? Pressure at any given point on the earth is created by the weight of air in the atmosphere above it. Therefore, pressure reduces with height – there is less air above you. A change in pressure of one millibar (mb) at 500 metres above sea level is a height difference of about 8 metres.

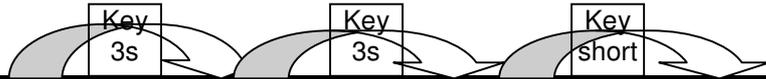
In practice, it is not as simple as that because of the many other factors that influence air pressure. On a stable day, temperature induced differences of 1mb mean a height difference of +/-10 metres. Depending on the weather, air pressure at sea level (QNH) may vary from 950 mb to 1050 mb. In order to eliminate the influence of the weather, the altimeter has to be calibrated at certain intervals. This means the altimeter has to be set to a known height and show this height.

During rapid weather changes e.g. the passage of a cold front, the air pressure can change by 5 mb during a day. This means a height difference of 40 metres!

Another way to calibrate an altimeter is to set it to QNH.

What is QNH? General air traffic needs a common zero point. This means that at a certain height all aircraft show the same height on the altimeter. The reference point for this is QNH. The QNH is the actual pressure calculated back to sea level (1hPa=1mb). It is calculated several times a day and can be taken from the weather forecast for aviation or it may be requested from airfields.

Setting options



Key	Function keys	Set	Option		
	ALT 1	Height ALT 1	Unit Alti 1 m, ft	Unit QNH hPa, inHg	Corr Sensor correction -47.9 to 47.9
	ALT 2	Height ALT 2	Unit ALT2 (m/ft)	REL/AbS Mode A2	

ALT1 Direct functions



Press the Altitude Key to alternate between displaying *ALT1* (current barometric altitude) and *ALT2* (reference barometric altitude).



The *ALT3* display shows your altitude difference since *ALT3* was last reset, or since the instrument was switched on. Press *Clear ALT3* (the Down Arrow Key) to set this number back to 0.

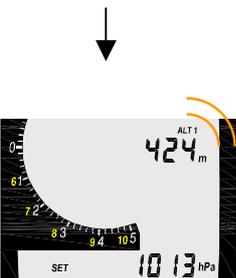


Set-Mode ALT1

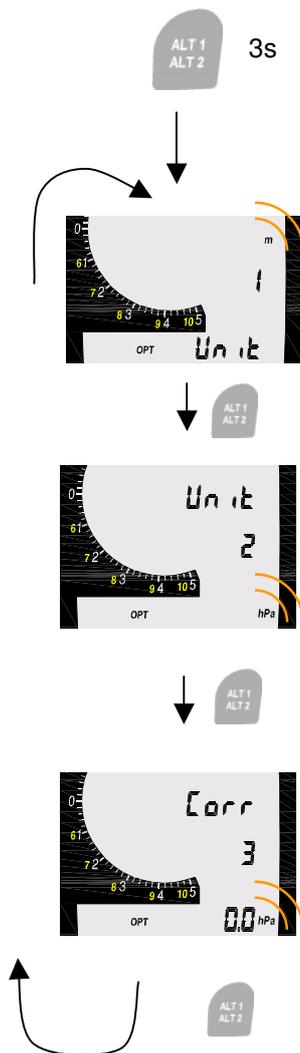
Press the Altitude Key for three seconds during *ALT1* display to bring the instrument into *ALT1* Set-Mode. Now use the arrow keys to set your current altitude..



You can also choose from among five pre-set locations using the *MEMO* Key. To edit a pre-set altitude when it is displayed, use the Arrow Keys. Unlike other setting changes, this edit must be **confirmed with a short-press to ALT1**.



Notice that QNH is displayed below the altitude, and that it changes as the altitude changes..



Option-Mode ALT1

Further long pressure on the Set-Mode key brings the instrument into Option-Mode.

Option 1 Unit

The units of height to be displayed are set here.

Option 2 Unit

For the ALT1 value hPa or inHg pressure units can be chosen.

Option 3 Corr

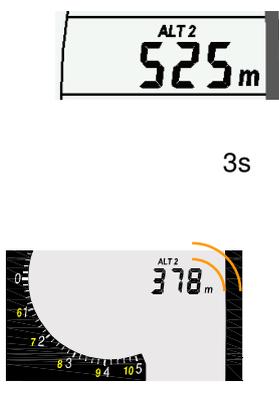
Pressure corrections can be made in this mode. This may become necessary when the pressure sensor, after several years use, is no longer exact.

The maximum correction possible is +/- 47.9 hPa.

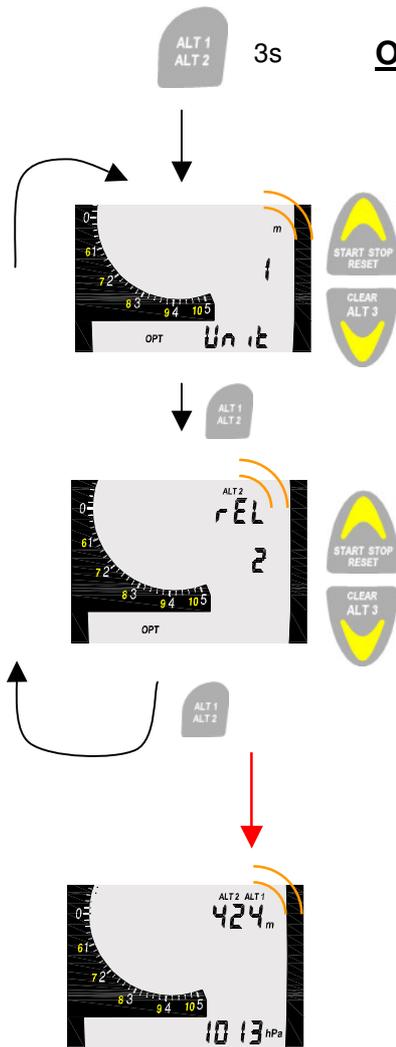
A short press of the Altitude Key cycles you back to Option 1.

Set-Mode ALT2

While in the ALT2 display, press the Altitude Key for three seconds to bring the instrument into ALT2 Set-Mode.



In ALT2 Set-Mode a reference height can be set (e.g. the relative height to a goal or waypoint). In order to do this ALT2 must be set to relative height.



Option-Mode ALT2

Further long pressure on the Set-Mode key brings the instrument into Option-Mode.

Option 1 Unit

The units of height to be displayed are set here.

Option 2 Rel Relative height, ALT2 only

For the ALT2 value, relative or absolute values can be chosen.

If you would like to see height in meters and feet, change the display to absolute. In Run-Mode ALT1 and ALT2 are of equal size. You can set one of the values to feet.

TIP: To view your current altitude in both meters and feet, change this option to *ABS* and set the units for *ALT2* to *m*. In Run-Mode you can now toggle between *ALT1* and *ALT2*.

IMPORTANT:

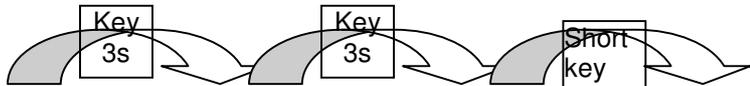
If you have chosen Abs for **ALT2** in Option Mode, **ALT1 and ALT2 are linked together**. This means that there is only **one Set-Mode for ALT1 and ALT2**. Option-Mode remains separate.

To leave this mode, change the setting „Rel“ ALT2 in Option Mode to „Abs“. To call up ALT2 in Option- Mode you have to switch, in Run-Mode, to ALT2 and long press the ALT1/ALT2 key twice.

Variometer

The Variometer, the most important instrument, can be adjusted to the pilots' requirements.

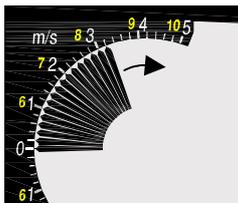
Audio keys



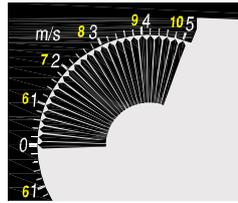
	Key	Audio setting	Set	Option					
Direct choice		Volume 6 levels	A-Int Basic damping 1,2,3,4	Unit VARIO m/s, ft/min- x100	d-Int Integra- tion time 1 to 30s	Audio starting point 0.02...0.4 m/s	Audio Pitch Max. at about 3 to 11 m/s	ASI On/Off	

Analogue Vario-Beam Display

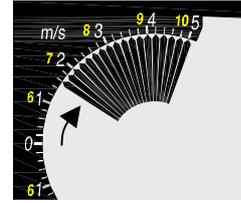
Each graduation on the beam scale equals 0.2 m/s. Up to 5 m/s the beam fills up from the centre. When the climb exceeds 5 m/s, the climb is displayed in reverse e.g. the display at 5 m/s is full and it begins to clear from the middle.



Climb at
3.2m/s



Climb at
5m/s



Climb at
6.6m/s

Direct functions

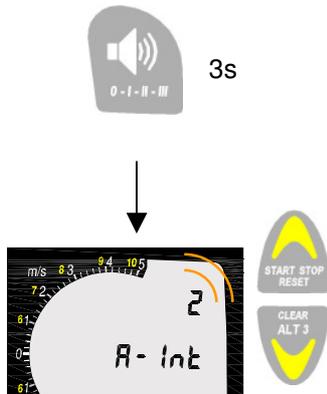


The internal loudspeaker volume is set with this key. There are six levels ranging from zero volume to maximum and back to zero. The volume is shown in three stages in the display.

Level 0	Levels 1 and 2	Levels 3 and 4	Levels 5 and 6
No Symbol			

When a new level is set there is a time lag of about 0.5 seconds before it activates. This also applies when switching off from level 6 to level 0.

Vario Set-Mode



Press the Vario Key for three seconds to put the instrument into Vario Set-Mode.

A-Int = Analogue Integrator

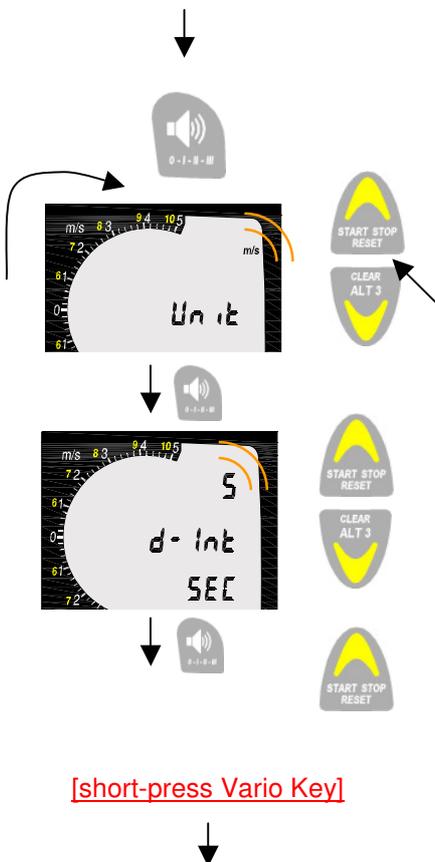
The basic damping of the Variometer is set here.

Four levels are displayed. The damping corresponds with the following times.

Level	1	2	3	4
Damping about	0.5s	1s	2s	3s

This setting influences all further filters.
 It can also be used as a turbulence filter.
 Still air = 1
 Turbulent air = 3 to 4

Vario Option-Mode



Further long pressure on this key in the Set-Mode brings the instrument into Option-Mode.

Option 1 Unit Set units

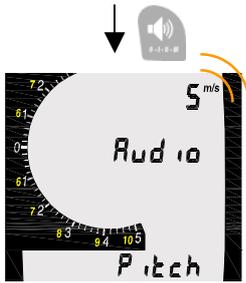
Set the required unit for the Vario display here. The options are m/s or ft/minx100.

Option 2 d-Int Digital Integrator

The digital integrator can be set from 1s to 30s.

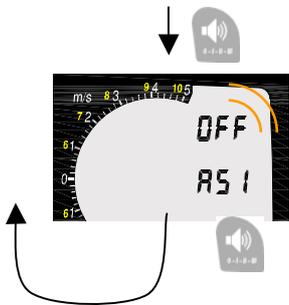
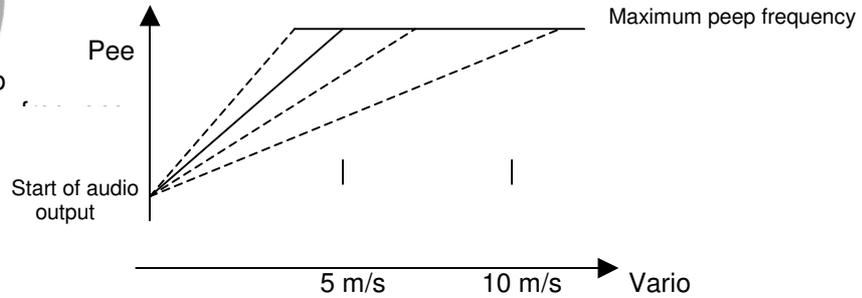
Option 3 Audio Audio threshold (dead band)

Use the Arrow Keys to set the threshold for the climb tone. The level can be set from 4 to 100 ft/min, and is displayed on the analogue vario scale (each segment on the scale equals 4 ft/min). The example on the left shows a setting of 12 ft/min. This means the vario will start beeping when your climb rate reaches 12 ft/min.



Option 4 Audio Pitch Audio Pitch

The range of the peep frequency can be set to different climb rates.



Option 5 ASI Audio Scale Indication

The audio scale indicator can be set to on or off (ON/OFF).

The audio scale indicator switches the rate of the peep tone from 50%/50% to 65%/35%, each time the vario reaches an uneven number.

0 ... 0.99 m/s	50%/50%
1.00 ... 1.99 m/s	65%/35%
2.00 ... 2.99 m/s	50%/50%
3.00 ... 3.99	65%/35%
and so on ...	

Sink Alarm

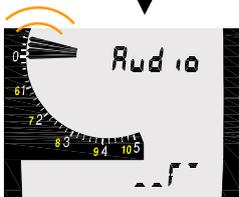
	Key	Audio-changes	Set	Option					
Direct choice		Sink alarm On/Off	Audio Sink alarm Setting of start level with keys ▲▼	Unit TEMP °C, °F	Corr Correct temp sensor -8.0 to+7.9	Unit Speed km/h, kts, mph	StALL Stall speed	Corr SPEED Correct speed 50..100.. 150	SPEED disp Display change Temp 4s, Speed 30s, 60s, 120s, ∞

Direct functions



The sink alarm is switched on or off with this key.

The sink alarm sounds when a certain sink speed is exceeded.



Sink Alarm Set-Mode

Further long pressure on the sink key brings the instrument into Alarm Set-Mode.

The speed at which the alarm activates can be set here.

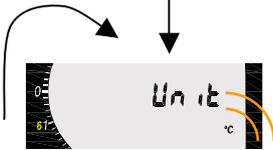


Sink Alarm Option-Mode

Further long pressure on this key in the Set-Mode brings the instrument into Option-Mode.

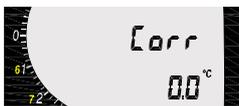
Option 1 Unit

The units of temperature can be set here. There is a choice between °C or °F.



Option 2 Corr Temperature Correction

Temperature deviation can be corrected here. The maximum correction values are approximately -8.0 to +7.9°C. This correction is necessary when it is felt the temperature sensor is wrong. However, remember how difficult it is to measure temperature exactly. The temperature display has a certain delay because the temperature sensor is measuring the temperature inside the instrument - so it may not match the ambient air temperature.



Note: The IQ-ONE can accept input from an optional Vane Wheel Airspeed sensor. (available separately) The plug-in port for the sensor is on the left side of the instrument. **Option 3...6 are only available if the airspeed sensor is plugged in!**



Option 3 Unit (Set speed units)

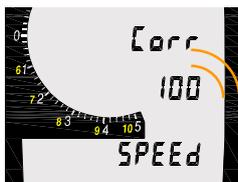
Units for the speed display are chosen here. The choices are km/h or kts and mph.



Option 4 Stall (Stall Speed)

The stall alarm sounds when flying too slowly results in an interruption to the laminar flow.

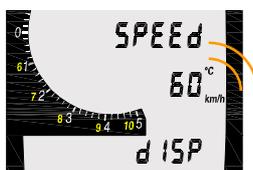
The stall alarm can be switched off (value shows 0 km/h), or can be set from 10 km/h upwards.



Option 5 Corr Speed (air speed correction)

A wing wheel sensor is used as a speed indicator (can be bought separately).

Speed correction is in %. This correction is necessary when you are under the impression that the displayed speed is incorrect. The accuracy of the speed displayed is greatly influenced by the mounting position of the speed sensor, therefore, you should take care when installing the wing wheel sensor. Inaccuracy of the wing wheel sensor can be due to the production process in the range of $\pm 2.5\%$ (industry standard).



Option 6 Speed Disp Speed Display

Speed Disp shows if, and after what time lapse, change from speed to temperature display takes place.

The following can be chosen:

- speed only
- change after 30 seconds
- change after 60 seconds
- change after 120 seconds

The temperature display appears for 4 seconds. If no speed sensor is switched on, only temperature is displayed.

Time Functions

On/Off Key



Key	Function key	Off	Set	Option
	TIME	Off with confirmation	Time, year and date	Date - format 12/24
	CHRONO	Off with confirmation		
	MEMO	Off with confirmation	Recording interval Off, 1, 5, 15, Clear All, del. Baro	Setting to record; height, speed, temp

Direct functions



Repeated pressing of the TIME/CHRONO/MEMO key (called TIME key in future), changes the time, stop watch and memory displays.

When in Time or Chrono display, a short press on the START/STOP/RESET key starts the stop watch. A longer press on the same key resets the stop watch to zero.



During the MEMO display you can change between the actual flight and stored flights using the arrow key.

The actual flight is not disrupted.

In *MEMO* display, when barograph recording is enabled [Model IQ-ONE+ only], the instrument will revert automatically after twelve seconds to *TIME* display.



Set-Mode TIME

Further long pressure on the TIME key brings the instrument into Time-Set-Mode. The Time-Set-Mode is only active when no flight recording takes place. Please note, when switching off, the longer hold will take you into this menu, even if no flight recording was active.

Time and date can be set here using the arrow keys.

Pressing the TIME key briefly allows you to choose which values to set. This data is not visible on the startup page.

Note: Starting to switch off the instrument will take you into Time Set-Mode. **In order to switch off without setting the time, do not release the key**, but continue to hold it down while the instrument counts down from 3 to 1.



Option-Mode TIME

Further long pressure on the key in Set-Mode brings the instrument into Option-Mode.

The choice is between 24h und 12h (am/pm) being displayed.

Flight Logging

The IQ-ONE / ONE+ automatically logs each flight, beginning when you turn on the instrument and ending when you turn it off. Up to forty flights are recorded; after that the oldest flight is deleted as each new one is added. The flights are numbered in reverse order, so that # 1 is the newest and # 40 is the oldest. Flight # 0 is the current flight.

With the MEMO display showing, use the Arrow Keys to cycle through viewing the previous flights you have stored. If this is done during a flight, the current flight will not be disrupted.

Memo displays

Graphic displays of maximum climb/sink

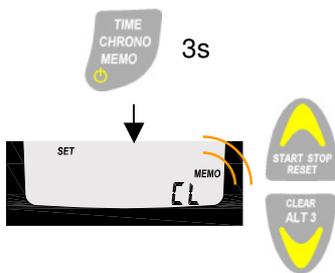
- ← Maximum change in climb/sink values
- ← Maximum height reached
- ← Flight number. A Small r indicates that a barogram was recorded for this flight too.
- ← Date of flight
- ← Flight time

Battery, volume and sink alarm display (independent of record flight)



Memo Set-Mode IQ-ONE

Further long pressure on the TIME key brings the instrument into Memory-Set-Mode.



In the basic set up, flight recording and barograph are switched off together.

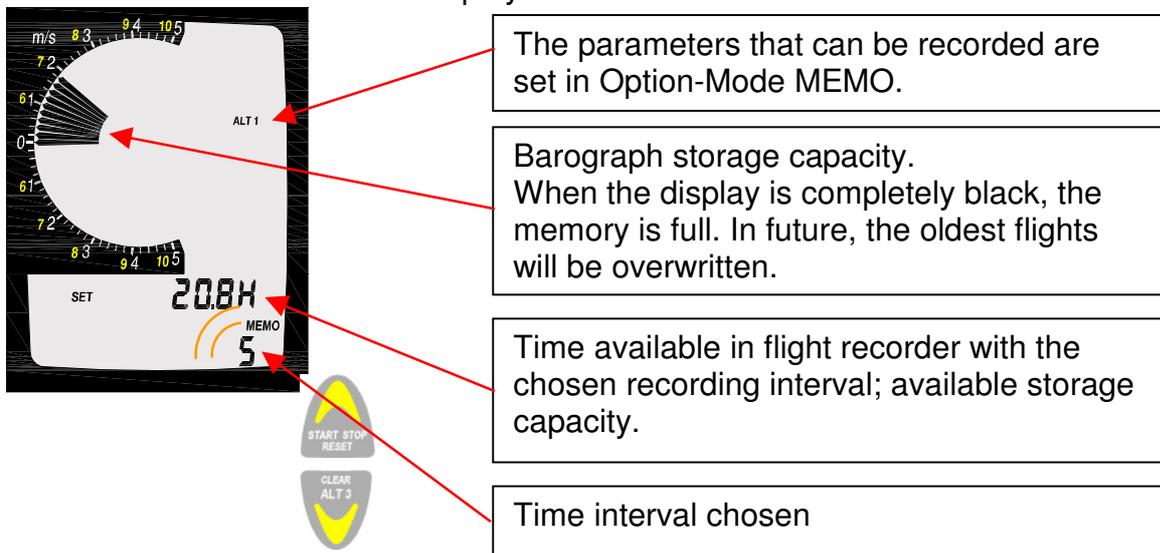
By pressing the UP key, barograph recording can be switched on.

Barograph Recording – Model IQ-ONE+

The IQ-ONE+ includes a barograph, which records your flights in a tamper-proof format for use in competitions and setting official records. You can set the parameters and time intervals at which recordings are made. A data port on the right side of the instrument allows you to connect the IQ-ONE+ to a computer (on Model IQ-ONE there is a plastic plug in this location in lieu of the connector).

While a flight is being recorded, you cannot enter Set-Mode or Option-Mode for MEMO, ALT1 or ALT2. This is to prevent changes of altitude after a flight has begun.

A recording interval of 1 second is displayed first. After further pressure on the Up key 5, and then 15 seconds are displayed.



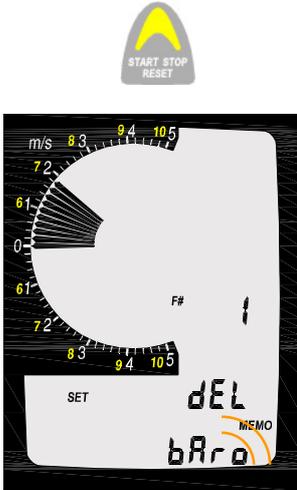
In Set-Mode MEMO when flight recording is activate, the instrument starts recording the flight as soon as it is switched on. (The flight recording interval has to be set to 1s, 5s or 15s). The number of this recorded flight is zero (0).

To record the flight as valid, in the logbook and on a barogram, flight acceptance must be present. A flight will be accepted when a height difference of more than plus or minus 30m has been recognized and the recorded flying time is more than 2 minutes.

A new flight is started when leaving Set or Option-Mode and no flight acceptance for the previous flight has been recognized.

When a flight acceptance is present, Set or Option-Mode MEMO, and Set-Mode or Option-Mode ALT1/2 cannot be entered. This is to prevent changes of height after a flight has been accepted.

The instrument transfers all recorded data to the barograph at 2 minute intervals. In the worst case scenario, only the last two minutes of data can be missing from the barogram.

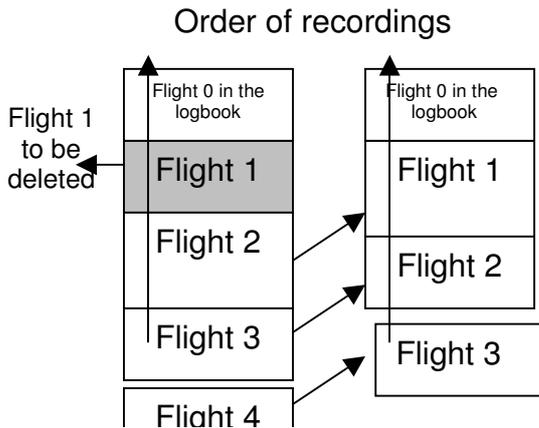


At Del Baro (gram) the number of the flight to be deleted is shown at the top. To confirm this you press the ALT1 key for at least 3 seconds. The number refers to the last flight in Memo.

If no flight recording was activated at number 1, but it is visible in the log book, flight number 2 will be suggested, and so on, until a flight with a barogram appears that can be deleted.

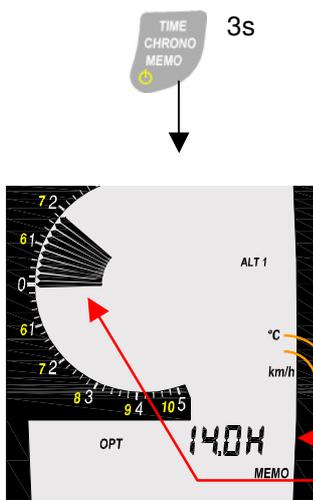
No single flights can be deleted directly from the log book. Barograms recorded later in the logbook cannot be deleted before those recorded earlier have been deleted.

Explanation of the recordings in the logbook
(When all flights were activated for barograph recording.)



Further pressing of the UP key allows you to choose whether to delete all the recordings and the logbook. To confirm this, you press the ALT1 key for at least 3 seconds.

Option-Mode MEMO



Further long pressure in the Set-Mode brings the instrument into Option Mode MEMO.

The parameters to be recorded on the barogram are set here. The choice is between:

- ALT1: only height 1
- °C und ALT1: height and temperature
- km/h und ALT1: height and speed

Available recording time with the actual recording capacity and the chosen parameters.

Batteries

2 x Alkaline Type size AA, 1.5V

or

2 x rechargeable NiCd or NiMh accu size AA1,2 V

Error messages

Lo Batt	Battery voltage less than 2.1 V Please change batteries
Lo	Temperature is less than -50° C
Hi	Temperature is higher than 76° C
Err	Temperature sensor is faulty
Hi	Speed is higher than 159 km/h
Err	Frequency converter for measuring speed is faulty
AdErr	AD-converter for measuring pressure is faulty

If the instrument is showing one of this error messages, send the instrument with a description of the fault, to your BRÄUNIGER GMBH dealer or direct to BRÄUNIGER GMBH.

Maintenance and Care

Water Damage

Water damage invalidates the guarantee.

If the instrument suffers water damage, proceed as follows. Remove the batteries at once. Rinse the instrument with fresh warm water. Dry the instrument (e.g. warm air, hair dryer). Send the instrument, as soon as possible, to your BRÄUNIGER GMBH dealer or direct to BRÄUNIGER GMBH for testing.

Warning: NEVER dry the instrument in a microwave oven.

Malfunction

Should you have a problem when running the instrument, remove the batteries for five minutes. When the batteries are returned, the instrument carries out a self test.

If the problem persists send the instrument, with a description of the problem, to your BRÄUNIGER GMBH dealer or direct to BRÄUNIGER GMBH.

Guarantee Limitation:

In rare cases it may happen that the instrument does not provide any data at all, or the data is incorrect. BRÄUNIGER GMBH is not responsible for any damages due to the incorrect functioning of the instrument. **Responsibility for ensuring safe flight lies with the pilot alone.**

Technical Data

Size:	138 x 74 x 23 mm (4-3/8 x 2-3/4 x 13/16 inches)
Weight:	178 grams (6.278 ounces) with 2 alkaline batteries, without mountings
Power Supply:	2 x AA alkaline batteries or NiMH batteries
Battery Life:	>250 hours with 2 alkaline batteries
Altimeter:	max 11,500 m (37,700 feet), 1 m (3 ft) steps
Variometer:	analog ± 10 m/s (2,000 ft/min), 0.2 m/s, (40 ft/min) steps digital ± 96 m/s (19,200 ft/min), 0.1 m/s steps (10 ft/min)
Integrator (Vario Averager):	adjustable from 1 sec to 30 sec
Speed Display:	digital 0 to 160 km/h (99 mph) displayed in km/h, kts or mph resolution: 1 mph, 1 km/h or 1 kts calibration range $\pm 50\%$
Temperature Display:	-50 °C to 76 °C (-72.4 °F to 168.8 °F)

	display: °F or °C resolution: 0.1 °C (0.1 °F)
	accuracy: ± 0.5 °C, calibration possible
Time Functions:	real time clock (12h/24h) with date
	stop watch up to 99 hrs 59 min 59 sec
	automatic calendar, automatic logging
Max. Barograph Recording Time [IQ-ONE+]:	130 hours flying time
	recording interval: 1 sec, 5 sec or 15 sec
	recording of altitude, altitude and speed, or altitude and temperature
Number of Logged Flights:	40 with date, start time, flying time, max. altitude and min/max vario
Operating Temperature Range:	5 °F to 140 °F (-15 °C to 60 °C)
Storage Temperature Range:	-22 °F to 158 °F (-30 °C to 70 °C)

The technical data may be changed at any time.