COMPUTER

Uwatec Galileo Sol

PLUS

+ One step closer to being a computer that adjusts for your own body function.
+ Easy to use.
+ Comprehensive display.

MINUS

- You'll have to wait for a trimix model.

THERE HAVE BEEN SOME BIG CHANGES in Uwatec products since dynamic young Italian Sergio Angelini became boss of the Swiss diving computer arm of Scubapro.

Sergio's love of diving is second only to his love of big bikes. With three dozen other journalists from diving magazines worldwide, I trekked over to the super-modern factory near Zurich for the launch of what he had promised would be a remarkable step forward in diving computer design.

"Made in Switzerland" still means something here. In an age of out-sourcing to the Far East, it was refreshing to see that this company still employs Swiss staff in a clean, hi-tech factory set in a pretty valley.

Sergio and I have been on liveaboard trips together. Detecting that I looked daunted during his comprehensive technical description of the all-new Galileo Sol, on my departure he discreetly thrust a pre-production example into my hand. This meant that I would probably be the first diving writer to subject the unit to real, in-water, extensive testing.

In fact, the Galileo Sol proved not at all daunting. It is menu-driven, has three buttons and is as easy to set up and use as a mobile phone.

The instruction manual, written by someone who both writes manuals and dives, is relevant and understandable.

THE TROUBLE WITH COMPUTERS is that they all work out decompression assuming that you are the standard diver the physiologist assumed you were when the algorithm was written with a number of theoretical tissue models.

However, people vary in height and weight – and how can a computer know what's going on inside your body?

As a first step, Uwatec introduced the adaptive ZH-L8 ADT algorithm, which took into account water temperature.

I had trouble with this idea, because a diver properly dressed in a warm drysuit and undersuit in cold water will be warmer than one in a 3mm suit shivering in warmer water.

However, a cold body does suffer vaso-constriction of the blood supply to the peripheries, and this would slow down off-gassing in those areas.

Recently, with its gas-integrated diving computers, Uwatec incorporated the diver's breathing rate in the algorithm. But now it has moved a big step closer to matching computer to diver.

In league with Finnish manufacturer Polar, Uwatec has dovetailed its latest computer's incoming data with that of a submersible heart-rate monitor that the diver wears around the chest (**1**). If you use it under a drysuit, you need to make sure that the contact areas are damp – never a problem if you have a leaky inflation valve!

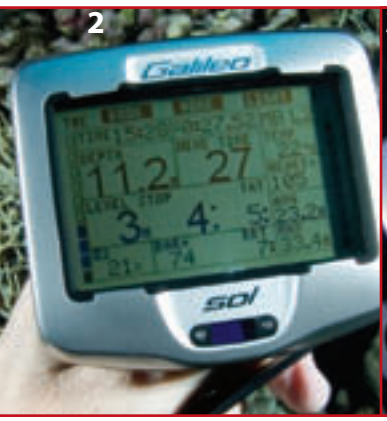
The Galileo Sol is gas-integrated by radio transmitter, so your breathing-rate can be included alongside tank pressure and remaining gas-time. You can choose whether heart or breathing rate takes precedence in deco calculations, or leave it to go by the worse case of the two – or even the opposite.

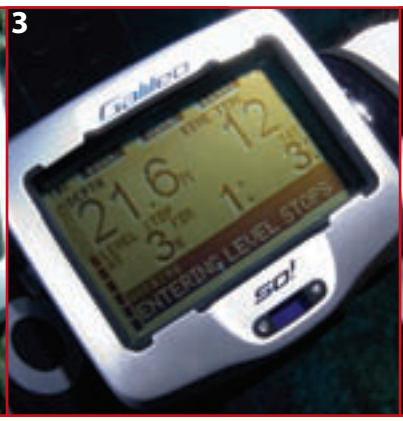
Not only that, but it can be used with up to four tank transmitters – three for yourself, in varying nitrox mixes, and another if you want to keep an eye on your buddy's gas supply.

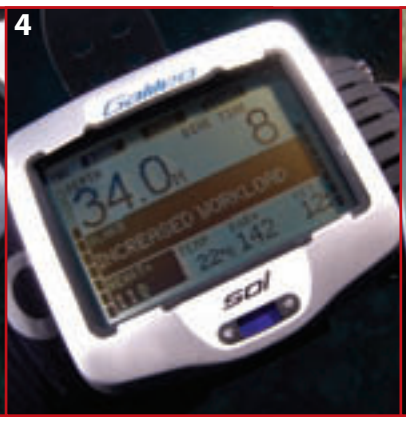
So the latest Uwatec ZH-L8 ADT MB PMG algorithm can now include water temperature, breathing rate and the diver's actual heart rate as it changes during the dive in its calculation of required deco.

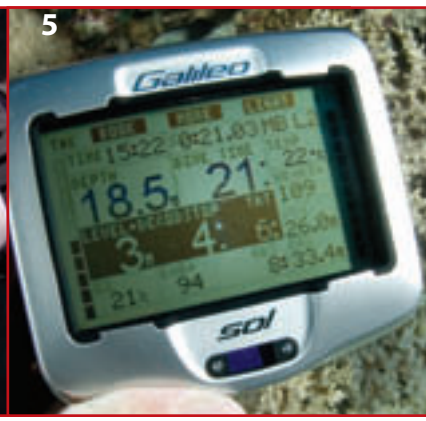
It's an eight-compartment, adaptive micro-bubble, predictive multi-gas algorithm.

If on the dive it displays the message "Increased Workload", this implies that no-stop times may be drastically shortened, or deco times increased.









The predictive multi-gas algorithm means that you can see at a glance your deco if you were to continue using the gas you are breathing, or the reduced deco times should you change to richer nitrox mixes.

The packaging

With all this technology to package in one unit, the Galileo Sol might have ended up looking as if it was salvaged from a WW2 submarine. The screen does seem enormous, but the Uwatec engineers came up with a slim oil-filled case that could withstand enormous pressures without ill-effects. It is said to go safely to 330m, yet is hardly an imposition to wear.

Unlike other oil-filled computers the battery compartment on this one is air-filled, so you can change the batteries cheaply yourself. The chip is reprogrammable over the Internet, too, so it should never become obsolete. An Infrared link means that the program can be downloaded in only six minutes.

Set-up mode is accessed via the three buttons. Enter personal details that come up if the worst happens – up to 20 lines of characters. You can even put in useful messages such as "Is It Time For Lunch?" or "Can You Remember How To Get Back To The Shot?".

This type of display means that important warnings also come up as words, not just beeps and flashing displays. You'll know what's up instantly, even if you turn off the audible warnings – or all the warnings!

Text warnings are along the lines of "Ascent Too Fast" or "Max Depth Reached" or "MOD Exceeded". Bar graphs indicate nitrogen and oxygen loading. You can substitute the oxygen graph for one representing tank pressure.

You can personalise everything by interfacing the Galileo with your PC via SmartTrak. Under water, it can display actual and predicted dive profiles, a tissue-loading graph and even maps and simple pictures (such as a diagram of the wreck you are diving) downloaded from your PC.

Displays

You can use any of three screen formats under water – "Full" information (**2**), the "Classic" display (**3**) with bigger but fewer figures, or the basics. Pushing the centre button accesses more information by going up one level of display, so whichever the display, you can access any information you want on the dive.

The Sol version of the Galileo is for multi-gas use. Radio-linked to your tanks via up to four transmitters, it will display remaining gas time (from a chosen tank) or remaining no-stop time, whichever is the lesser. Gas-integration means that it can show actual tank pressure as well as remaining gas time, plus a three-minute warning and your planned tank reserve, as well as being sensitive to your breathing rate.

On reaching your planned reserve, the unit informs you and shows the tank information as white on black. All displays that might require immediate action are reversed out in this way.

The predictive multi-gas algorithm accounts for time on alternative gases. Under water, the Galileo gives a summary table of deco for all the gases you might be carrying, and total ascent times. The displayed remaining bottom time is based on the first tank used, and it recalculates as you go. You have 30 seconds' grace to switch over.


1

The gas switches can be programmed in to be automatic, or switched manually during the dive.

For those who wish to stay out of deco, the Galileo can activate an optional warning when you have only two minutes of no-stop time left at your current depth.

Once into deco, the relevant graphics appear as white on black. Level stops from the micro-bubble settings are black on white as normal, but mandatory deco stops are reversed so that no mistakes are made. The display reads "Entering Level Stops".

As on some other Uwatec computers that can be set with micro-bubble levels, level stops are optional.

But should you miss any, the algorithm simply cascades on to a lower MB setting, adding deco time where needed. In this case it will display "MB Stop Ignored", and later read "MB Level Reduced".

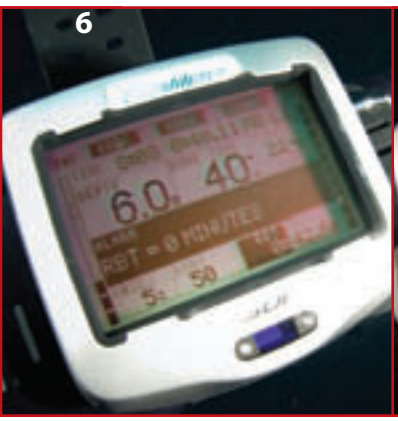
The unit can show you a profile of the dive so far and a profile of what you should be doing. It can also reveal the theoretical tissue-model loadings.

The Galileo automatically switches to gauge-mode once you pass 120m. It then displays ascent speed in m/min, and although you can switch gases it shows tank pressures only. Its timer goes into stopwatch mode in hours and minutes.

Galileo in action

Sergio told me that the Galileo had been subjected to thousands of test dives with divers at the Brothers in the Egyptian Red Sea, so I set off on a Simply the Best safari on Tony Backhurst's Tornado Marine liveaboard *Hurricane*.

John Bantin has been a full-time professional diving writer and underwater photographer since 1990. He makes around 300 dives each year testing diving equipment.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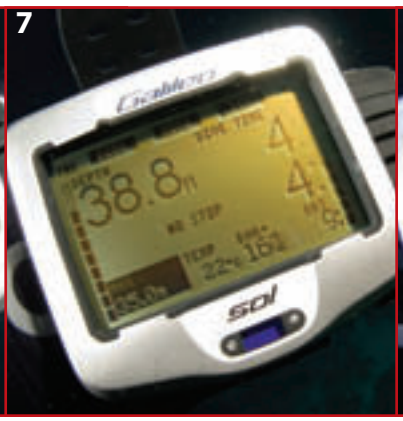
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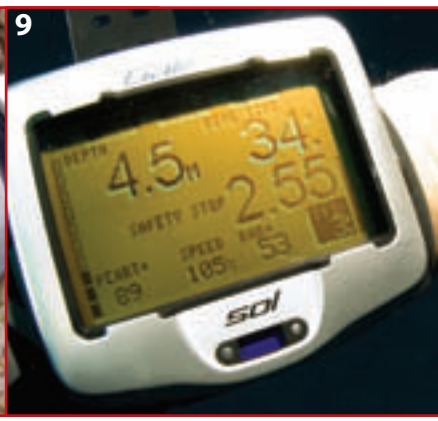
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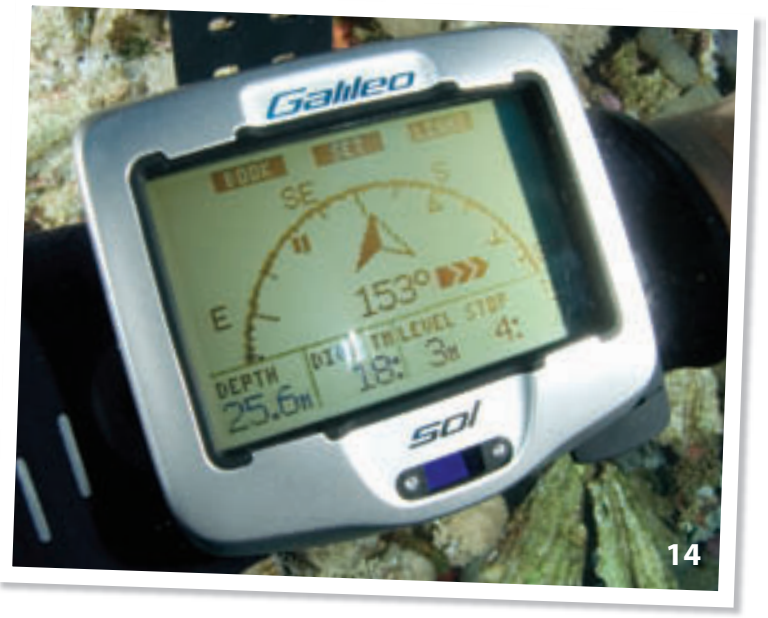
Telling it as it is…



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My initial dives were on a single tank, but backed up by two other computers that were following my actual dive plan, I was able to play at setting a higher percentage of O_2 to make the computer think I was going beyond my maximum operating depth, or using air while I was actually using nitrox, in order to see what happened when it went well into stage- decompression.

I couldn't discover how to set it up without air-integration. I had intended to simulate a three-tank dive, but that was not to be.

It was the same story when I wanted to use it with a regulator that gave no room for the rather bulky transmitter. But with the transmitter and a single tank it paired magically, and the display was easily read.

I pre-set the computer for a heart-rate range of 80-150bpm. At depth, even when relaxed, my heart rate was 80bpm, higher than the 50bpm I had recorded in the office.

Finning really hard, I got it to 120bpm before the "Increased Workload" warning came on (**4**). After I got my suit on, I soon forgot about the heart-rate monitor.

THE GALILEO SOL HAS BUILT-IN independent illumination for the LCD screen. I thought the backlight could have been brighter. I had the contrast cranked up when diving at night but still needed a torch to read the "Full" display. I recommend a Classic screen-setting for night dives.

The micro-bubble setting MB2 made the unit even more cautious than the very judicious Suunto RGBM100 running alongside it, so I soon readjusted to MB1.

This was better, but once it showed "Level Stops Plus Deco" (**5**) I was unsure how much of the total was Level Stops. Checking the projected dive profile graph didn't clarify that, so I hung around at 15m (a rudimentary deep stop) and saw the level stops magically disappear, leaving a short deco-stop at 3m.

At one point the Galileo calculated that I had insufficient gas to reach the surface, clearly reading "RBT= 0" (**6**). After that, "Tank Depleted" came up when I got past the predetermined reserve pressure and "MOD Exceeded" was unmistakable at depth. (Don't try these things at home!)

You can switch between Classic (**7**) and Full display on demand, check model tissue loading and even examine a profile of your dive so far, with a projected profile for the quickest safe ascent (**8**).

You can have the Safety Stop timer come on automatically in the shallows or activate it manually. Either way, it counts down minutes and seconds in big figures (**9**).

During a long wait at Elphinstone Reef at 6m, when the oceanic whitetips finally appeared I noticed my heart rate slow to a more normal 60bpm. Obviously the pressure of depth makes my heart beat a little faster. I saw the rate average a steady 90bpm during most parts of every dive.

Clearing my ears during a descent caused a peak, and I hit 120bpm getting back into a RIB when some weighty divers perched thoughtlessly on the opposite tube forced me to climb. All this was revealed in one of the alternative dive-profile graphs available, displayed in logbook mode after the dive (**10**). (There are of course comprehensive dive-planning modes too.)

The logbook mode (**11/12**) gives masses of information in layer after layer, equating to a lot more than time and maximum depth (**13**).

Conclusion

I found the Galileo Sol to be as comprehensive as any nitrox computer can be – and it even has a built-in "full-tilt" digital compass with a bearing memory that does not need to be calibrated before use. "Full-tilt" means you can use it effectively while held at any angle, and it was a joy (**14**).

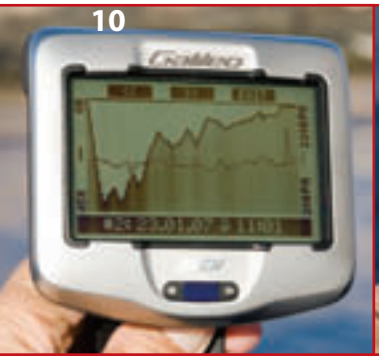
The tilt-free feature is important under water, and this time the computer still displays essential information such as depth, dive time, tank pressure and deco status.

No doubt we shall see simpler, less expensive versions, and as we speak Uwatec has commissioned research in Norway to come up with a properly researched table for use with helium mixes.

That could put an end to the current guesswork situation in which deco plans developed from old Buhlmann tables in the public domain are extrapolated for use with trimix.

The term "full-function decompression diving computer" has new meaning. Complete with heart-rate monitor and one tank-transmitter, the Uwatec Galileo Sol costs £869.

✹ Scubapro, www.scubapro-uwatec.com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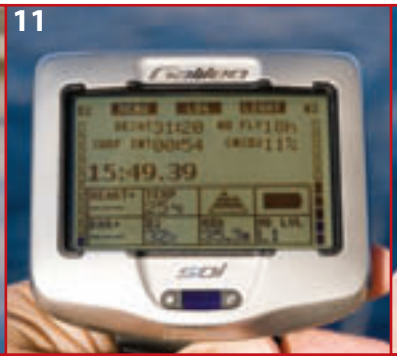

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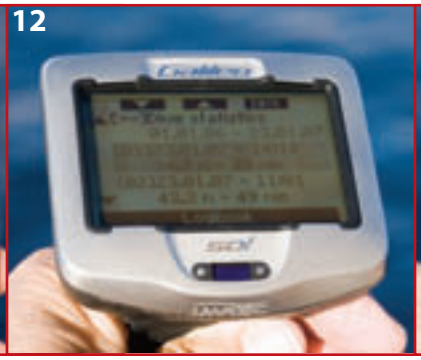
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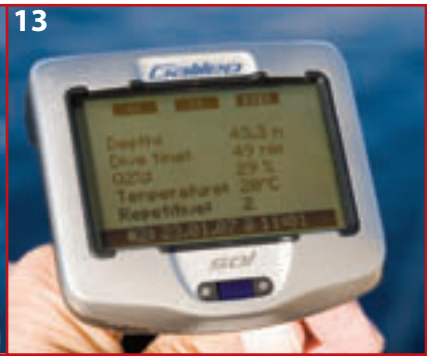
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