WELL AND TRULY TESTED

'I saw the reassuring little heart icon on the screen steadily pulsing away to confirm that I was indeed alive' – NIGEL WADE tests the computer that gets to know you

COMPUTER

SCUBAPRO **MANTIS M1 WITH HEART RATE MONITOR**

IN THE EARLY DAYS, DIVE COMPUTERS WERE crude and unreliable. One particular model earned the nickname "Bendomatic".

In those days I preferred to calculate my no-stop times using tables and a wristwatch which, incidentally, led to very short bottom-times but minimised the chances of getting a decompression hit.

Since those dark days, dive-computer technology has advanced. The humble tables and watch are left for diver-training agencies imparting basic principles to their students, and the modern dive-computer has become standard kit for all but a few.

Modern dive-computers work using decompression algorithms. Simply put, these are advanced dive-tables used in conjunction with a depth-sensor and timer.

Scientists and physicians have experimented with numerous algorithms, calculating the levels of various gases in divers' blood and tissues and how they act in their bodies for years and continue to do so.

The biggest challenge for these boffins has been to find an all-encompassing formula that will keep everyone safe – one that fits us all regardless of age, body size, shape, fat-content, gender or fitness levels.

Everyone is different (thankfully) and we all absorb and release gases at differing rates during a dive. The ideal solution would be to stick a needle in an arm and link it to some form of super-biological computer that reads and recognises exactly what's going on inside our bodies with regard to micro-bubbles.

This may be impractical, but forward-thinking dive-computer manufacturer Scubapro has taken a few steps towards personalising our algorithms by adding a heart-monitor to read our work rates under water and adjusting the decompression calculations accordingly.

Initially it has incorporated this concept in its Galileo range of block-style computers. Now it has launched the same principle in its latest wristwatch-size computer, the Mantis M1.

The Hardware

The Mantis M1 comes in a compact timepiece-style wrist computer featuring what the maker calls "Katana sharp graphics" in a back-lit segmented LCD display set behind a mineral glass face.

Scubapro Mantis M1 dive-computer with Polar belt and USB data-transfer cradle.

The case is constructed from two-tone brushed marine-grade 316L stainless-steel, with four magnetic control buttons reducing the number of failure points that could cause a leak at depth. The bezel has imprinted labels to identify these button functions.

A user-replaceable lithium-ion CR2032 battery that's claimed to last for two years or 300 dives powers the computer. A buckle-style adjustable polymer strap is augmented with an additional extension piece for use over thicker wetsuits or drysuits.

The Mantis I was sent to test came with a USB dongle and interface cradle to download and log the dive profiles to my PC.

It was also supplied with a Polar heart-rate monitor belt. This, I'm told, will have been upgraded to Scubapro's own version by the time you read this feature, and the new version will also include a skin-temperature sensor to add to the personalisation of the Mantis to your own body.

The Functions

The main feature of the Mantis is its adaptive biometrics for what the maker calls "Human Factor Diving". This allows for personal customisation of the dive profiles, and at present takes into account the user's heart rate via the simple Polar heart-monitor belt.

The Mantis has all the other functions you would expect in an up-to-date dive instrument. These include nitrox settings from 21 to 100% with a choice of three gas mixes, Gauge, Apnea and Decompression modes plus a CCR mode for fixed PO_2 rebreathers.

It doesn't stop there, however. The Mantis also has the ability to be used as an altimeter, thermometer or a chronometer with a lap-memory function. It can also be used as a stroke-counter while swimming, recording the distance covered, and, with the aid of the cradle and software, it can be a calorie-counter too.

Oh, I almost forgot to mention that it can be used as a digital watch as well as an alarm clock.

The Algorithm

The all-important algorithm used in the software is Scubapro's own ZHL-8 ADT MB PMG, an advanced predictive multi-gas algorithm that calculates the formation and release of micro-bubbles in the body.

These micro-bubble settings can be adapted to take into account the user's experience, age and personal fitness level to ensure that safer profiles are calculated.

The addition of a heart-rate monitor enables the computer to constantly readjust its decompression calculation based on real-time, real-person information.

In Use

I took the Mantis on a Red Sea trip to put it through its paces. Before I bore the pants off you with the algorithm thingy, let me tell you about the computer itself.

My eyes are as old as I am, so they're classed as antiques, and they don't work as well as they used to and need some help. I could either get expensive prescription lenses for my mask or a bigger, sharper screen on my dive-computer.

What I found with the Mantis was that although the screen and graphics are smaller than those of a block-style computer they have a really good contrast.

I could see them clearly and assimilate the information displayed easily and instantly – a big plus factor.

The menus are accessed with a series of pushes on three buttons. The bottom-left button gave me the option of selecting or exiting the menu choices, and the two on the right scrolled up or down. The fourth button activates the backlight, which increases the screen contrast even more.

I fitted the Polar HRM belt under my wetsuit and saw the reassuring little heart icon on the screen steadily pulsing away to confirm that I was indeed alive and that it had paired with the Mantis.

What I can't tell you is whether it made any difference to my profiles. I always dive with nitrox if it's available and I always dive conservatively. The last thing I want is a painful and potentially dangerous bend plus a harrowing trip to the recompression chamber because I was stupid.

What I'm saying is that I couldn't bring myself to push the limits for this test. I did however have my own tried and trusted dive computer with me. It uses a reduced gradient bubble model (RGBM) algorithm and has kept me safe over more years than I care to remember and over thousands of dives.

I compared the difference in no-stop times and deco penalties by setting them both to air (with the added safety factor of actually breathing 32% nitrox) and wasn't surprised to see that the Mantis gave an average of 4-5 minutes less bottom-time on the test dives.

This was obviously the safer option, and the one I followed religiously.

SPECS

PRICE ›› **£369**
ALGORITHM ›› **Scubapro ZHL-8 ADT MB PMG**
MODES ›› **Deco, Gauge, Apnea, Fixed PO_2 CCR**
NITROX ›› **Three gases, switchable**
FO2 ›› **21% to 100%**
PO2 ›› **1.2 to 1.6bar**
MAX DEPTH ›› **120m**
POWER ›› **User-changeable lithium CR2032 battery**
BATTERY LIFE ›› **Two years / 300 dives**
STRAP COLOUR OPTIONS ›› **Black, blue, red, yellow, pink**
CONTACT ›› **www.scubapro.com**
DIVER GUIDE ★★★★★★★★★☆

Conclusion

I don't know of any other computer-maker using biometrics by incorporating a heart-rate monitor to adapt the profiles in real-time, real-person scenarios.

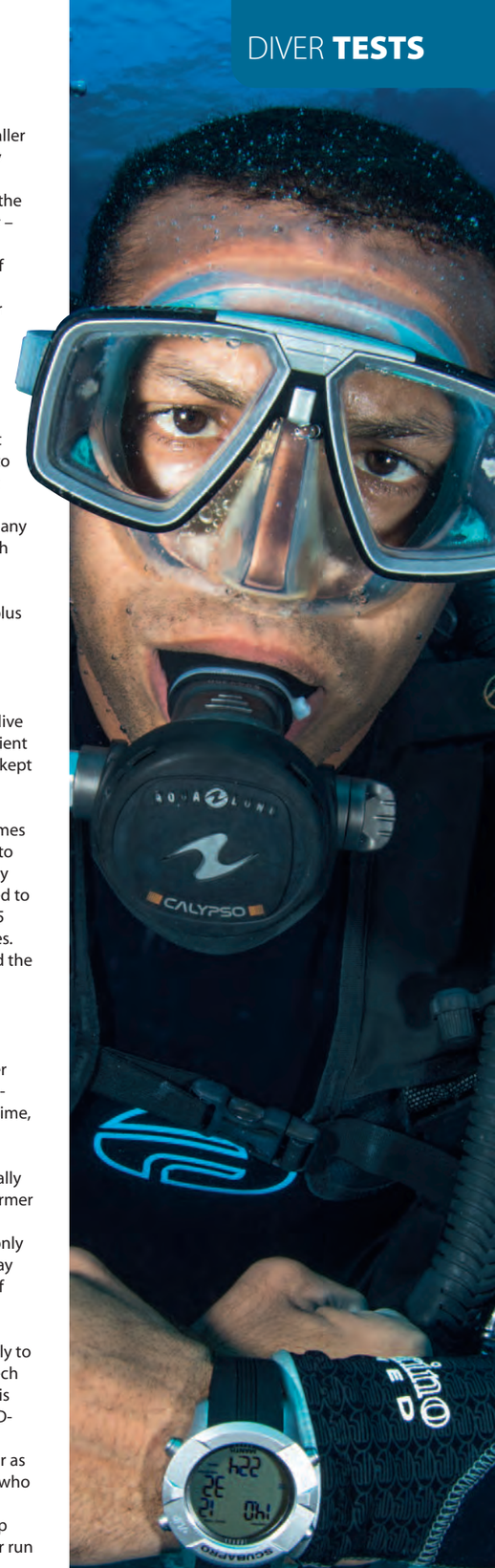
The addition of the skin-temperature sensor will be even more valuable, especially when your body temperature is much warmer than the water when wearing a drysuit.

Existing dive-computers can measure only the ambient water temperature, which may have a detrimental bearing on the state of play decompression-wise.

The Mantis is the nearest I've seen to a plug-into-your-arm computer, and it's likely to become closer still. There is also a Black Tech model available (see *Just Surfaced*) and this has a reversed LCD screen and a black PVD-coated case.

The Mantis M1 is stylish enough to wear as a replacement for a watch, telling people who care to notice that you're a diver. For the fitness fanatics, the extra features will keep you up to date on how far you've swum or run and how many calories you've used.

For me, however, when I'm not under water all I need to know is how long it is until kick-off at Stamford Bridge. ■



The Mantis M1 graphics are easy to read because of their contrast.