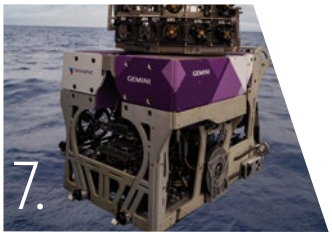
ROV PLANET



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TELEDYNE LAUNCHES NEW WAYFINDER DVL FOR MICRO VEHICLES


Courtesy of Teledyne Marine

ROV Planet Interviewed Grant Jennings, Product Line Director at Teledyne Marine to find out more about the recently launched Wayfinder DVL.

RICHIE ENZMANN: Hi Grant, please tell us about the Wayfinder DVL. How is this different to the existing range of DVLs – such as the Pathfinder, Pioneer, Tasman, or Workhorse Navigator – that Teledyne has to offer?

GRANT JENNINGS: It's a new product for a new market. As you know, we've been pioneers of DVLs for the last 28 years. Everything we designed was mainly for work class ROVs and AUVs, but in the last 5 years we've seen a change of direction in the market towards much smaller vehicles and within the last 2 years, we've seen a lot of new customers moving towards the micro ROVs like those produced by BlueRobotics, SeaDrone, even smaller than the SeaBotix vehicle that Teledyne manufactures.
Three years ago, we launched Pathfinder, the smallest DVL we've produced, and it has done phenomenally well. The Pathfinder set a new standard for small DVLs in performance and quality of data, because we've utilized the past 20 years of our experience from designing and building DVLs.

Now Pathfinder is even too big for these micro vehicles. In the past we were talking $50-$70K for a small vehicle. Now they're $5,000. You can't sell a sensor that is over $10,000 for a $5,000 vehicle, especially one that's 12 inches long and 7 inches high.
We listened to our customer base and we sold a large number of Pathfinders for these types of ROVs, but for some customers, even the Pathfinder was too large. Hence, we kicked off a project last year and we produced something that is half the size of a Pathfinder. Now the Wayfinder is literally a 10cm square – a small cube – and it's everything in a self-contained unit.

RE: It sounds small.

GJ: It is very small! This is also our first product with our brand-new Doppler platform. The markets have changed, and we needed to shrink everything, about a year and a half ago we started to develop our new Doppler platform which is now the basis for all our future products.
With that we had to add more channels so we could do smarter things. It's not just having a simple 4 beam DVL; we're looking to the future. Customers who perform up down measurements for currents and bottom tracking utilize two sets of electronics. Now we are moving to do that with one single board set.
As you know electronics move on every year; they get faster, lighter, smaller. So that's what we've done. We adapted and got a brand-new set of Doppler electronics, and Wayfinder is the first product to utilise this new engine.

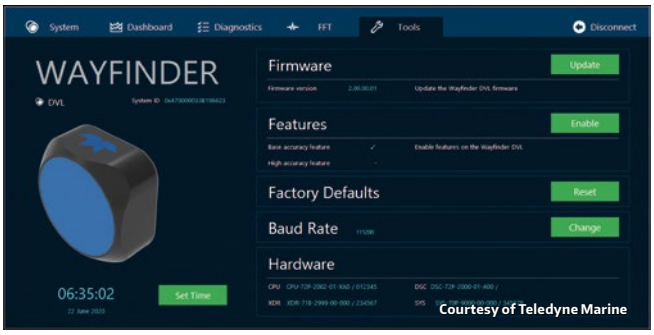
RE: So, the change of electronics helped you a lot?

GJ: A change of electronics and materials. These small ROVs do not need to go to 1,000m. Most of them operate in waters 100m or less, so you can shrink the thickness of the housing walls and use lighter materials when we are not reliant on going to deeper depths with greater pressures.

RE: And I guess the range and accuracy can be shortened as well then.

GJ: Yes, exactly. The nice thing is that we've actually taken the same transducer design from the deeper-rated Pathfinder. The high-end quality is still there, but how we build it is different. We only need a 60m bottom tracking range, not several hundred meters. Everything all comes together and allows us to shrink the package down in size.

Courtesy of Teledyne Marine



Courtesy of Teledyne Marine

RE: Do you make the transducers in house?

GJ: Yes! Everything. We take the raw ceramics and machine them on an incredibly precise diamond tip lathe. Everything is manufactured here in San Diego, and it's been like that for over 35 years. In this facility we build all our ADCPs and DVLs.

RE: Do you have any special features? I saw the other Teledyne DVLs measure temperature and depth.

GJ: This market doesn't need all the bells and whistles. The Pathfinder and the Tasman obviously have all of that. The first Wayfinder we launched into the market really is a bare bones DVL. We purposely kept all the features out because we want to keep it simple and affordable.
Wayfinder reduces the integration time, you connect power and RS 232 serial comms to the integrated cable, and then you're up and running. We actually designed a brand-new simplified binary data format, and we're giving our customers the Python drivers needed to read the data. So basically, we wrote code in Python to match the drone processors these ROVs are using.
We obviously have our SeaBotix vehicles, but we specifically purchased a Blue Robotics BlueROV2 to understand how this new customer base interfaces to third party sensors. We've had one for a couple of months now and we integrated the DVL into that. It's up and operating on the same platform that the typical marketplace is using.
I suppose the new features include a much-simplified user interface. You're literally wired into the electronics bottle. You cut and paste our code, which we provide, and you're up and running in a couple of hours.

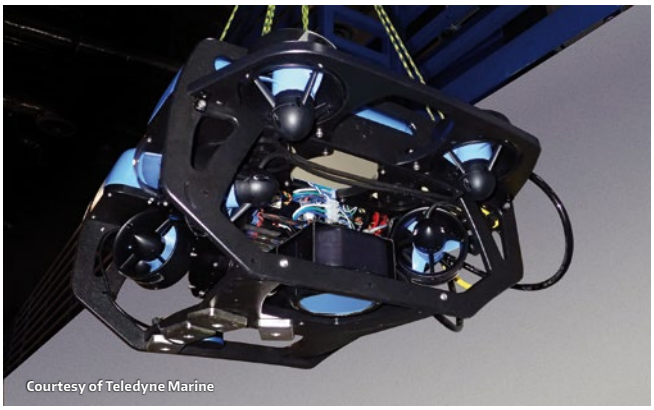
RE: Sounds like it is almost open source then.

GJ: It is. We will have all of this available via our website, and it'll be the first product that we'll allow our customers to buy online. We host all of these tools -now available on our new Shopify site, where customers in the US can also purchase online. This is another first for us.
Even to purchase a system we're keeping it simple. You won't need to call up to get a quote. You can just click and buy online.

RE: Did you have any challenges? Sometimes making it simple can be challenging as well.

GJ: The challenge for us was that we started from scratch.

Courtesy of Teledyne Marine


Courtesy of Teledyne Marine

Obviously, we had the transducer and our history, but because we wanted to make it flexible, simple but upgradeable in the future, we needed a new electronics setup. I suppose the only challenge was working with a new platform, but we have such an amazing engineering team here in San Diego who were all excited to work on this.
Actually, one of our main integration engineers used to be part of the AUVSI RoboSub competition, so his past experience made it very simple. The main challenge for us was to get familiar with this new platform, but the integration – the mechanical and electrical – was easy. That's what we do; that's our bread and butter.

RE: Is this the ROS (Robotic Operating System) platform? That seems to be quite popular these days.

GJ: Yes, that's correct. We have the Python drivers on our website that you just import into ROS. We created all the apps that you need for those different platforms, and it's all open source.

If you're using it for aquaculture, station keeping, cleaning nets, then the Wayfinder would work for you. But if you're doing mine hunting or precise navigation, then you would continue to use the Pathfinder.

In the past the Pathfinder was overkill for some of these more basic operations. It's a highly accurate system like the Tasman, but a lower depth rated package. For search and recovery or inspection the Wayfinder is all you need.

RE: What depth rating and price range are we looking at?

GJ: 200m as standard to match the vehicles that it's going on, and it's $7,500 USD. It's our first DVL under $10K.

RE: How is the launch coming along?

GJ: Excellent! We launched the product in late August alongside the official RoboSub virtual competition this year. The response from the industry has been phenomenal.

RE: Do you have plans to develop this range further?

GJ: Yes. As with other products, when customers need other features, we'll develop them over time. It was the same with the Pathfinder when we launched that. It was a basic DVL to start with, but soon we added current profiling, extended range bottom tracking, roll & pitch sensors, etc., so that really progressed. Our goal is not to take business away from the Pathfinder, it's in a great marketplace and it's been very successful. It's a brand-new Doppler platform, and we hope to see new developments every 3 months or so based on customer feedback. It's a new market for us; a smaller entry level platform. There are so many if you think of the RoboSub community. Last year when we attended, there were over 50 teams, with more than 50 vehicles, and every vehicle was different. The most common thing was the platform. They were all using the ROS. But every single vehicle was a different size or shape and had different capabilities. We've been talking to those teams over the last 3 years because of the Pathfinder. However, even though the Pathfinder is a low-cost sensor, it's still too expensive for these particular platforms. The Wayfinder opens that door for new applications and new needs for a DVL. It's interesting to see what people are doing with these vehicles.
There is so much emphasis on the ocean and the environment. And these vehicles are giving more scientists opportunities to survey and gather data that they never had before. You can go out with a very small boat and throw these $5,000 vehicles off the side and look at what's happening to the environment. The data the scientists are gathering from this class of vehicle is incredible, and we're going to enable them to gather better data by being able to navigate and hold station when recording certain data. In the water you need to hold station when there is current flow, and that's exactly what the Wayfinder has been designed for: to give them that capability. We're extremely pleased to play a role in expanding the value and capability of these powerful little vehicles.


Courtesy of Teledyne Marine