

Chasing M2 and Qysea v6 ROVs

by Peter Rowlands

Ardent UWP readers will know that I have a 'bit of a thing' for ROVs (remotely operated vehicles) and I have reviewed and reported on several over the years.

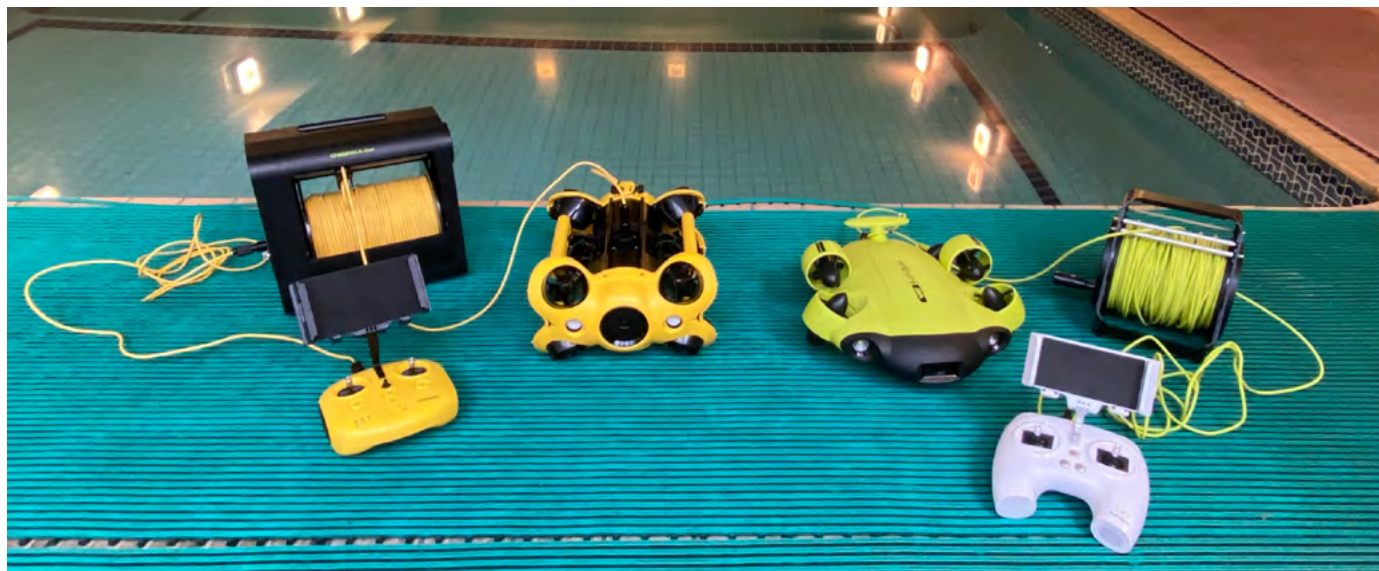
In particular I have had a good relationship with Chasing ROVs (www.chasing.com) from their original Gladius to Chasing Dory, Gladius Mini and now the M2 which, I have to say, is their most impressive machine to date.

UK agent AlphaGeo (www.alphageouk.com) were kind enough to send me a review machine and my first trial was in a swimming pool. They sent me a 'full spec' package (£2499) with the optional E-Reel (£649) but without the Robot Arm (£449).

The setup is even simpler than previously because the WiFi electronics are combined into the hand controller which eliminates another set of connections and wires. This is a really big improvement from a practicality and reliability point of view.

Having 'flown' previous Chasing models I was at home right from the start. The only need was to change the joystick configuration from JPN to USA settings in the menu to make them as logical as a DJI drone.

The M2 owes much of its design philosophy to the working class ROVs from the offshore exploration industry but miniaturised. There is no external fairing as with previous models and it is this which makes it such a versatile mover



The Chasing M2 with optional E Reel is on the left and the Qysea v6 with standard reel is on the right

underwater.

Fairings are designed to aid movement through water but they can create unnecessary drag in certain directions. The fairing-less M2 moves equally well in any direction and with its 8 thrusters that really means in ANY direction at equal speeds.

Being able to be positioned at any angle is very useful but it can be disorientating especially when the M2 is out of vision at depth but fortunately there is a 'Return to level' button on the controller which is an absolute godsend because, as the name implies, it returns the M2 to a level posture on the same heading and holds it there. It's a bit like turning an electronic device off and on again! In open water I found myself using this facility time and time again so I think it is a very important and impressive capability.

The swimming pool environment is perfect for starters as it's clear, comparatively shallow and

you can see the machine at all times. It's the perfect visual feedback to help you get 'a feel' for the joysticks and what they do. Even as an experienced Chasing 'pilot' the M2 was a cut above in terms of performance both at any angle and any direction. Very responsive yet when left 'joystick-less' it stayed put in both depth and heading, again just like a DJI drone.

My primary interest in ROVs is to look for interesting sites without the physical and time limitations associated with scuba diving and the M2 fits the bill perfectly. It can be tilted down (or up or any angle, in fact) to look towards the seabed and when the 'forward' joystick is operated it proceeds at that angle and at that depth. This is perfect for rapid progress over a flat site. Previous models, and other ROVs, would maintain the angle but go deeper, pushed down by the water movement over the fairing.



The M2 battery has a removeable battery so if you are away from power you can take a spare battery (or more) to increase your work time



The lens covers 152° and there is very little distortion.



The M2 is very stable and easy to control around delicate marine life but, in common with most small ROVs the two lights either side of the camera do create backscatter in all but the clearest of water.

The M2 has been improved in several ways over the Gladius Mini but I think it unfair to compare the two directly because, as previously stated, the M2 owes its design and performance to working class ROVs whereas the Mini is aimed at the more recreational market.

As an existing Gladius user I was pleased to see that the M2 now has a removable SD card for easier transfer of image files, especially the larger 4k video files. In addition there is a rear 'cable post' for looping and retaining the umbilical taking the strain off the plug-in connector and providing a

more natural flow for the umbilical. In addition the M2 with its open frame has easy to grab lift handles on all sides making lowering and retrieving it very positive and therefore safer.

The other big design departure and improvement is that the M2 has a removable battery so if you are away from power you can take a spare battery to double your work time.

Photographically not much has changed because the Mini was already

very good with 4k video/12mp stills but, and I think this is a significant change, the angle of view is now a very useful 152° rather than the 94° on the Mini. This is much better for viewing sites and a very productive improvement. In addition the F1.8 lens improves low light performance.

Speaking of light, the M2 has two 2000 lumen LED lights (three levels) which are very useful in clear water but, as they are fixed close to

the lens, they will create backscatter in turbid water.

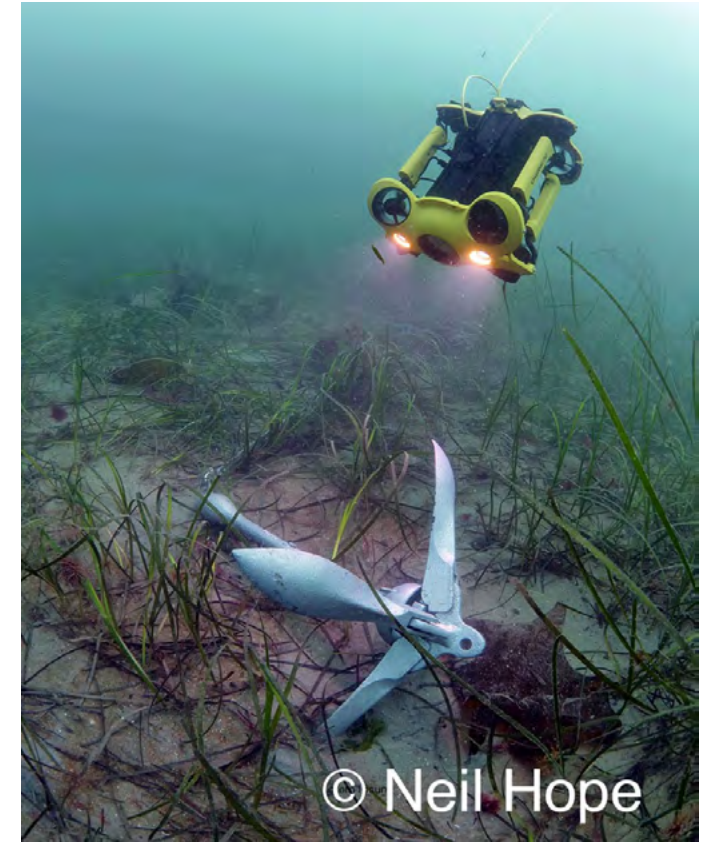
Operating the M2, or any ROV for that matter, from a boat is much more complicated than an indoor pool. The differences are purely physical in that there are more forces of influence at work i.e. the boat movement, surface wind and underwater current.

The boat movement and, to a certain extent, the surface wind are solved by anchoring but the



Local underwater photographer Neil Hope and I had a fun 'dive'. I was able to see him through the ROV lens so he was able to direct me to the correct pose. For me as the ROV pilot it was like I was diving with him and Neil said it was like having a well trained puppy so we naturally nicknamed the M2 "Rover"!

Filming salmon on the River Dart



underwater current, if significant, will cause a loop/arc in the umbilical which will increase drag even though the cable is not that thick. This is mainly because the umbilical is designed to float and, for the most part this is good because it prevents snagging underwater but the downside is increased drag.

To try and solve the drag problem we improvised a

'drop weight and loop' which effectively deploys the ROV as if it were exiting from a 'garage' on the seabed. This has two big advantages - firstly you know where the ROV is starting from i.e. directly underneath the boat and secondly it significantly reduces the looping drag mentioned previously.

I took to the M2 like the proverbial duck to water

and it is a major step forward in terms of set up and easy deployment. I had the feeling of being totally in control but when I needed to stop for a while to take stock I just let the joysticks go and the M2 stayed put while I decided what to do next. Flying any ROV, or air drone for that matter, is quite stressful to begin with and however experienced you are there

is always a fear of snagging especially on a varied terrain seabed.

During my time with the M2 I was able to give it a varied workout from filming salmon from the riverbank in fast flowing water, locating an anchor on the seabed which we didn't know about and finding new dive sites in places we wouldn't normally have bothered to look. In

short it was a most productive machine which I was loath to return to the UK importers!

There are some features and physical improvements which I would have liked. The first is better end caps for the unplugged cable connectors. With freshwater this is not a big deal but with saltwater it is a whole different ballgame and it would be much better to have proper screw on end



I taped up the exposed HDMI socket to protect it from saltwater and improvised a better socket cover for the ROV and controller.

caps to eliminate any saltwater ingress which would cause intermittent electrical connections. This applies also to the multi pin HDMI port on the controller which, when not in use, is totally exposed to the elements. I put some tape over it and also improvised with some bigger, more secure push on end caps.

Another improvement I would like to see is some form of indication as to how much umbilical is out at any time. This could be something as simple as markings on the cable itself either by colour coding markings every five or ten metres.

The M2 has a VR setting for Virtual Reality goggles and I bought a suitable pair which effectively allows a split image to be viewed on a mobile device slotted into the headset. The theory is sound and the image is



The standard pack comes with a manual cable winder. The £649 optional E Reel has an internal motor with a rechargeable battery and gearing to stow the cable very neatly on the drum.



certainly viewable but the way the app splits the image results in the gauges (heading and depth, most importantly) being hard to see. I have used other ROV headsets and this is not the case so it would be nice to see some work done on the app to improve this and then it could be very effective, especially in bright sunlight where a mobile phone or tablet is very hard to view clearly.

Another design which I would like to see improved is the hand controller (and this is true for every ROV I have tried), especially for use on a boat. Ergonomically it handles well and can be retained with a neck strap for security but if you want to put it down to attend to anything else, it is very unwieldy, especially with a tablet which makes it quite top heavy.

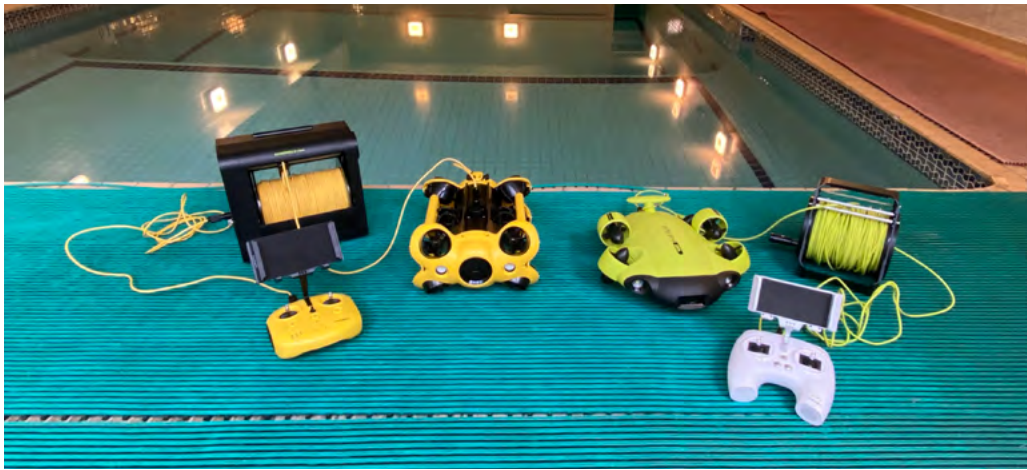
Chasing E Reel

The rechargeable E Reel is very impressive and whether it is worth £649 to you is your choice but I found it extremely useful and neat; in particular the gearing which stores the cable. The alternative is the standard rectangular 'manual' spool which I had on the Mini and which comes as standard on the M2.

Whilst this basic spool is very simple and effective with nothing to recharge or go wrong, the E Reel is one of those luxuries which once tried will always appeal. I guess the ideal would be the E Reel without the motor which would be much lighter, cheaper and easier to operate with a manual handle but still have the excellent self stowing gearing.



The VR setting on the M2 gave a viewable image but the onscreen gauges were not easily visible and when you are operating with the goggles on you have no other visual indicators so these gauges are important. I'm no IT guy but I would thought this is something which could be sorted out in the App and, if done so, would provide an excellent alternative to trying to view a smartphone or tablet screen on a sunny day.



Chasing M2 v Qysea v6

By a strange quirk of fortune I learnt that a business friend of mine here in Plymouth had just acquired a Qysea v6 which is a similar ROV to the M2 but with six thrusters instead of eight. He agreed to lend it to me for a few days and this gave me an opportunity to compare the two and the following has been a welcome opportunity for me and it says a lot about this evolving market and can offer you some timely advice if you are interested in buying either ROV.

The Qysea v6 is their second ROV; the P3 being the first and according to their website they are working on a much more photography aligned unit, the Ffish Pro Zen1.

For underwater photography there is very little difference between the M2 and v6. They both have 1/2.3"

sensors but the M2 has an F1.8 lens rather than the F2.5 on the v6 and finally the M2 has a 152° coverage whereas the v6 has 162°

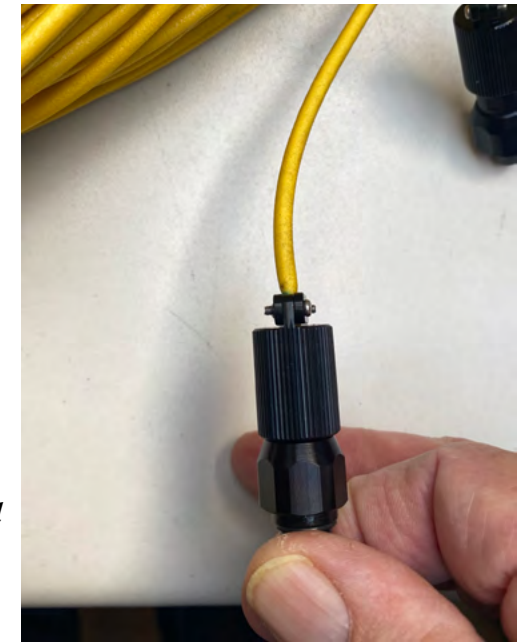
The v6 is similar in that it has a cable reel and joystick controller/wifi unit to control the v6 and stream the footage to a smartphone or tablet. Qysea don't offer the option of an E Reel but their standard manual reel is very effective and much better than the M2 standard rectangular reel. If it had self spooling gearing it would be perfect :-)

Setting up the v6 is pretty much the same as the M2 but the v6 app offers many more options in terms of joystick controls and the controller also has physical switches for various levels of capability which they confusingly call A, S and C - Attitude,



Qysea provide proper screw on end caps which cannot fall off and provide watertight cover. In addition the rear of their connectors has a short strain relief mould and the seal looks as if it is around the diameter of the cable.

The M2 umbilical cable (and the Gladius Mini) on the right comes with no protection caps and relies on a flat crimp which distorts the cable at the point where it has the most strain.



Sport and Combination.

When I first set up the v6 I found that there were too many choices on the app settings in terms of joystick controls and this got me off to a frustrating start and the online manual was not exactly clear but more about manuals later. Eventually I found the right one for me which mimics a DJI air drone and this is UAV USA.

With the joysticks controls set up how I like them the learning experience took a much better turn and I soon felt in control once more.

The v6 is very responsive and best used in the A mode initially until

you get used to its basic capability and, for me, this actually provides most of what I am looking for in terms of control. In S mode you can do barrel rolls and 360° rotation which is impressive but I suspect only needed in a limited number of situations but the good thing is that you have the choice.

There are two main things which I personally look for in an ROV; firstly the ability to tilt slightly down and secondly to then go forward at that depth. This makes checking out a flat seabed easy and if any large objects or terrain comes into view



the left joystick can be pushed forward to bring the ROV up and over the obstruction. The v6 does this but it took a while to figure out how to achieve this because, once again, the manual is not crystal clear.

The other main requirement is the ability to return the ROV to “level” i.e. no up or down tilt and no lean left and right. There was nothing in the manual about how to achieve this and it was only by e mailing Qysea’s very helpful support team that I was told that this was achieved by double clicking the “Posture” icon in the bottom left of the viewing screen. The M2 has a dedicated button on the controller.

Once this capability was now known, I felt that I had got to where I had been with the M2 right from the start. It had taken a lot of time and frustration but perseverance got there. I was in the fortunate position of not owning the v6 so didn’t have that “Have I chosen the wrong one?” scenario and the support team at Qysea have been excellent.

The last capability of the v6 is the VR mode and this is very impressive indeed and almost spooky! In C mode and VR set on the app, the supplied VR goggles provide an excellent view through the camera, the heading, depth and temperature which is most of what you need. The

goggles are great for viewing on bright sunny days. The spooky part is that when you move your head to the left, the v6 goes left and vice versa! Look up and down and it looks up and down!

I have only tried the VR in the pool but I suspect it will be very useful on a boat too. The only proviso being is that you need someone else to handle the umbilical and keep an eye out for other boat traffic.

I suspect the v6 is subject to ongoing development for there are regular app and firmware upgrades. Unfortunately the same doesn’t apply to the manual so let’s talk about them now.

Instruction manuals

As in so many cases with emerging technology, producing a comprehensive instructional manual can be a time consuming task especially when improvements are being introduced rapidly and I suspect this true for both Chasing and Qysea.

The M2 manual is just 7 pdf pages whereas the v6 is 24 but it doesn’t include some of the basic functions of the unit and there are several advanced features which don’t even get a mention. This can be very frustrating especially when you are producing a review which might influence a future purchaser.

Hopefully the instruction manuals will be developed at the same pace as the ROVs. I know there are YouTube videos from users but this is no excuse for a comprehensive manual for what are very capable and versatile machines.

Where to buy

If you are in the market for either of these ROVs I would strongly recommend that you buy it from the importer in your country. These are very technical machines and, should you need spares or repairs, it is much better to deal with your importer rather than the manufacturer in China.

Conclusion

As I am in the market to upgrade my Gladius Mini, this was a real world review.

The UK prices are £1899 for the standard v6 and £2499 for the M2 so the v6 is considerably less expensive and does come with a VR headset but these are £20 on the internet.

On price and like for like specification the v6 is undoubtedly the best value for money but I liken this to a Mac v PC decision. The v6 is less expensive, lets you get under the bonnet to customise it and performs equally well. The M2 on the other hand is more expensive and less customisable but, like a Mac, it looks great and provides what they think you want.

The problem for me is that I’ve been a Mac user since 1987 :-)

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Chasing M2
www.alphageouk.com

Qysea v6
www.mantsbrite.com

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