



SOLE SOURCE JUSTIFICATION

YSI RQPOD REMOTE/AUTONOMOUS SURFACE VEHICLE

SYSTEM OVERVIEW

The **rQPOD vehicle** system is comprised of a control and power module that can be adapted to a floating board platform, enabling either remote control or autonomous operation of the platform. By equipping the platform with water quality, current, and imaging sensors, users can perform surface water profiling over a wide area. The adaptive nature of the rQPOD allows users to use many different deployment platforms, from torrent boards to trimarans. YSI's modu-mount kits allows users to mount the rQPOD system to an existing platform, or users can choose from one of YSI's specially-designed platforms for single or multi-sensor deployments (*e.g.* combining current profiles and side scan sonar). Sensor data can be georeferenced via onboard GPS, GNSS, and RTK options; users can select the best option for resolution required for their deployment. The rQPOD also offers several options for telemetry, from Bluetooth to 2.4GHz radio, so that data can be viewed during a mission. The lightweight and portable design allows for quick and easy deployments, by a single person, in hard to reach areas. Xylem's HYPACK software is an option for mission planning, data collection, and data imaging, all in one package.

FEATURES AND SPECIFICATIONS

1. The vehicle shall have a top speed of 1.5 m/s.
2. The vehicle shall have a duration of 4 to 6 hours when running at a speed of 0.7 m/s.
3. The vehicle shall operate in a temperature range of -10°C to $+40^{\circ}\text{C}$
4. The rQPOD module shall be modular that can be attached to different floating platforms.
5. The rQPOD module shall be fitted with wet-mate able connectors for the thruster connections.
6. The rQPOD module shall be fitted with a GPS.
7. The rQPOD module shall be IP67 rated.
8. The completed vehicle assembly shall be one person deployable.
9. The vehicle shall have the ability to provide a bathymetric, discharge, or water quality surveys.
10. The vehicle shall have the ability to be remotely or autonomously driven. (if autonomous version)
11. The autonomous version shall have the ability to accept line plans programmed using HYPACK.
12. The vehicle shall be provided with a remote control for manually driving the vehicle with range up to 500 meters.
13. The vehicle shall be fitted with navigation lights.
14. The batteries used shall be both removable and rechargeable.
15. The battery compartment must be sealed and water-tight.
16. The thrusters shall be user replaceable.
17. The rQPOD module shall weigh no more than 3 kgs.
18. The rQPOD module shall be provided with a hard case for transportation with space for the rQPOD, thrusters, mounts, brackets, tools, spares kit, batteries, and remote control.
19. The Torrent Board V7 shall weight no more than 5 kgs with no equipment mounted.
20. The rQPOD shall be easily adaptable to the following torrent boards without any modification needed:
Standard V7, DUO, and TBX
21. The Torrent Board shall be provided with a soft carry case with shoulder straps
22. The system shall be easy to transport.
23. The complete system shall be lightweight and weigh no more than 12 kgs fully fitted with Torrent Board, Sontek M9 with PCM and GPS, and rQPOD assembly.



FEATURES AND SPECIFICATIONS

24. There shall be a number of torrent boards available that allow a number of different sensor options including a duo board that will allow integration of two sensor packages at the same time
25. There shall be a mini torrent board available to easily integrate the Sontek RS5.
26. The system shall have the ability to integrate 3rd party GPS units using provided splitter cables.
27. The system shall come with color coded parts for easy assembly.
28. The system shall come with removable skid guards to protect thrusters.
29. The vehicle shall have the capability of updating its internal software with newer versions in the field by the end user.
30. The autonomous version of the module shall be supplied with user-friendly mission planning software that accepts most standard geo-referenced chart types.
31. The vehicle shall be capable of working in fresh, brackish, or seawater.

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PROFILER SYSTEM SPECIFICS: METEOROLOGICAL

rQPOD

- Top Speed: 1.5 m/s
- Duration: 4 to 6 hours (@ speed of 0.7 m/s)
- Temperature Range: -10°C to +40°C
- Batteries: DJI Phantom 3 LiPO
- Transmitter Range: 500m
- Transmitter Make: Radiomaster TX16S
- IP Rating: IP67
- Weight: 2.2 kgs

Torrent Board V7

- Length: 1.08m
- Width: 0.65m
- Weight including M9: 9.8 kgs (12.0 kgs including rQPOD)
- Weight excluding M9: 4.7 kgs
- Transportation: Soft carry case with shoulder straps and storage pockets
- Fits one sensor at a time
- Sontek M9 or YSI EXO1/2/3 ready

Torrent Board DUO

- Length: 1.39m
- Width: 0.78m
- Weight excluding M9: 6.8 kgs
- Transportation: Soft carry case with shoulder straps and storage pockets
- Fits two sensors at a time
- Sontek M9 and/or YSI EXO1/2/3 ready; RS5 with adapter

Torrent Board DUO

- Length: 0.86m
- Width: 0.54m
- Weight excluding RS5: 4.5 kgs
- Transportation: Soft carry case with shoulder straps and storage pockets
- RS5 ready

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