

Radio-controlled boat for measuring water velocities and bathymetry

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Radio-controlled boat named “Hi3” was designed and developed in order to facilitate water velocity and bathymetry measurements. The boat is equipped with the SonTek RiverSurveyor M9 instrument that is designed for measuring open channel hydraulics (discharge and bathymetry). Usually channel cross sections measurements are performed either from a bridge or from a vessel. However, these approaches have some limitations such as performing bathymetry measurements close to the hydropower plant turbine or downstream from a hydropower plant gate where bathymetry changes are often the most extreme. Therefore, the radio-controlled boat was designed, built and tested in order overcome these limitations.

The boat is made from a surf board and two additional small balance support floats. Additional floats are used to improve stability in fast flowing and turbulent parts of rivers. The boat is powered by two electric motors, steering is achieved with changing the power applied to left and right motor. Furthermore, remotely controlled boat “Hi3” can be powered in two ways, either by a gasoline electric generator or by lithium batteries. Lithium batteries are lighter, quieter, but they operation time is shorter compared to an electrical generator. With the radio-controlled boat “Hi3” we can perform measurements in potentially dangerous areas such as under the lock gates at hydroelectric power plant or near the turbine outflow.

Until today, the boat “Hi3” has driven more than 200 km in lakes and rivers, performing various water speed and bathymetry measurements.

Moreover, in future development the boat “Hi3” will be upgraded in order to be able to perform measurements automatically. The future plans are to develop and implement the autopilot. With this approach the user will define the route that has to be driven by the boat and the boat will drive the pre-defined route automatically. This will be possible because of the very accurate differential GPS from the Sontek RiverSurveyor M9 instrument.