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**AHARDWARE AND SOFTWARE PLATFORM UNIFIED FOR CONTROL SYSTEMS OF AN AUTONOMOUS UNDERWATER PROFILING VEHICLES**

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**ABSTRACT**

This paper concerns with development of a unified hardware and software platform for control systems of autonomous underwater profiling vehicles of various types, both floating due to change in their own buoyancy, and tethered, moving with the help of electromechanical drives. The hardware of the platform is based on 32-bit ARM-microcontroller. The set of electronic PCBs is capable of operating DC motors, solenoid valves, pumps etc. It is also carries GNSS receiver and GSM/WiFi wireless communication modules. Embedded software is a RTOS-based modular framework, where all necessary basic functions have been implemented. Its functionality can be expanded by adding custom code to accommodate specific functions of a profiler. The diagnostic and programming software is implemented as a cross-platform desktop GUI application, which also can be expanded to match the profiler features. It controls the actuators, such as DC motors, solenoid valves, hydraulic and pneumatic pumps.

The control system was employed at prototypes of several underwater profilers (the buoyancy driven probe of the ARGO type and the underwater winch probe), as well as at a prototype of the control system of glider actuators. All of these systems undergo the field trials at the Black sea test site of Shirshov Institute of Oceanology Russian Academy of Sciences.

**Keywords:** underwater profiling probe, control system, microcontroller, software framework, oceanography.

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