

DESIGN AND CONSTRUCTION OF GROUND CONTROL STATION (GCS) AND REMOTELY OPERATED VEHICLE (ROV) FOR EXPLORATION OF OBJECT IN WATER

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ABSTRACT

The ROV robot vehicle is one of the categories of diving robots used for underwater monitoring and exploration. This research resulted in an ROV vehicle weighing 5 kg. The ROV in this study serves to explore underwater objects by utilizing a camera mounted on the vehicle. The ROV rides are equipped with GCS and are connected via the RS485 communication protocol and a 12 meter long cable. The GCS in this study consisted of a control box containing a control lever, a 4.3-inch TFT LCD, a 16x2 LCD and a series of switches and cable connecting sockets. The data received by the microcontroller is then acquired using LabView2016 and produces a GUI that contains data on the degree of slope of the vehicle to the x and y axes as well as the status of the leak sensor readings. In order to acquire video data sent by the vehicle, the author uses a USB capture card device and connects it to a laptop via a USB cable. To increase the stability of the vehicle when performing vertical movements (up and down), this study used 3 motors with additional 3 leaf propellers and a nozzle nozzle to increase the suction and thrust of the propellers. The ROV vehicle is capable of diving and moving to a depth of 2.4 meters. PID control with parameters K_p 16.33, K_i 5.44, and K_d 10.00 produces diving motion and holding depth with an error value of -7 degrees to the pitch axis.

Keywords: *ROV rides, GCS, LabView2016, PID*