

**A PRELIMINARY PROTOTYPE DESIGN OF UNDERWATER  
DATA ACQUISITION TOOL**

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**SCHOOL OF MARITIME STUDIES AND SCIENCE MARINE  
UNIVERSITY MALAYSIA TERENGGANU**

**2013**



**A PRELIMINARY PROTOTYPE DESIGN OF UNDERWATER DATA  
ACQUISITION TOOL**

**By  
MOHD AZAN BIN RAMLI**

**A thesis submitted in partial fulfilment of  
the requirement for the award of the degree of  
Bachelor of Applied Science (Maritime Technology)**

**DEPARTMENT OF MARITIME TECHNOLOGY  
FACULTY OF MARITIME STUDIES AND SCIENCE MARINE  
UNIVERSITI MALAYSIA TERENGGANU**

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DEPARTMENT OF MARITIME TECHNOLOGY  
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE

**DECLARATION AND VERIFICATION REPORT**  
**FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled:

**A PRELIMINARY PROTOTYPE DESIGN OF UNDERWATER DATA ACQUISITION TOOL** By **MOHD AZAN BIN RAMLI** Matric No. **UK 21771** have been examined and all errors identified have been corrected. This report is submitted to the Department of Maritime Technology as partial fulfillment towards obtaining the **Bachelor Degree of Applied Science (Maritime Technology)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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## DECLARATION

I hereby declare that this thesis entitled **A PRELIMINARY PROTOTYPE DESIGN OF UNDERWATER DATA ACQUISITION TOOL** is the result of my own research except as cited in the references.

Signature

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: 13 JAN 2013

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# **A PRELIMINARY PROTOTYPE DESIGN OF UNDERWATER DATA ACQUISITION TOOL**

## **ABSTRACT**

In this research, a preliminary prototype of underwater data acquisition tool was studied. Commercially available instruments that measure water temperature and other parameters usually needed large amount of data which lead to inflexible experiments and expensive. The objective of this research has lead to the development of three preliminary designs, in which the characteristics of the prototype were determined. All the designs were virtually drawn into autographic drawing in AutoCAD and 3D drawing in SolidWorks. The characteristics of the best and suitable design were determined using pairwise comparison chart (PCC) method and morphological chart method. The actual prototype was built after the best and suitable design was determined. In order to determine the efficiency of underwater storage measurement, the prototype tested in two conditions: the inlet does not have a non-return valve installed and the inlet has a non-return valve installed. Finally, development of data acquisition tool had done to fulfill its task to record seawater temperature. This research can prove that the prototype and design is highly efficient for underwater storage measurement in preliminary which can lead to development of new instruments for underwater data acquisition tool in future.



## **A PRELIMINARY PROTOTYPE DESIGN OF UNDERWATER DATA ACQUISITION SYSTEM**

### **ABSTRAK**

Dalam kajian ini, prototaip alat pemerolehan data air telah dikaji. Instrumen sedia ada secara komersil yang digunakan untuk mengukur suhu air dan parameter lain biasanya memerlukan jumlah data yang banyak seterusnya mengakibatkan kajian yang dijalankan tidak fleksibel dan mahal. Objektif kajian ini telah membawa kepada pembangunan tiga reka bentuk awal, di mana ciri-ciri prototaip telah ditentukan. Semua reka bentuk hampir ditarik ke dalam lukisan autografik dalam lukisan AutoCAD dan 3D dalam SolidWork. Ciri-ciri reka bentuk yang terbaik dan sesuai telah ditentukan dengan menggunakan carta perbandingan dari segi pasangan (PCC) kaedah dan kaedah carta morfologi. Prototaip sebenar telah dibina selepas reka bentuk yang terbaik dan sesuai telah ditentukan Untuk menentukan keberkesanannya dalam mengukur penyimpanan air, prototaip tersebut diuji dalam dua keadaan: ruang masuk yang dipasang dengan injap tidak berbalik dan ruang masuk yang dipasang dengan injap berbalik. Akhir sekali, pembentukan alat pemerolehan data dijalankan untuk memenuhi tugasnya dalam menentukan suhu air laut. Kajian awal ini membuktikan bahawa prototaip dan rekaanya sangat efektif dalam mengukur penyimpanan air yang boleh membawa kepada penghasilan instrumen baru untuk alat pemerolehan data air pada masa hadapan.