

LOW COST/LOW POWER DATA TRANSMISSION SYSTEM

Project Description

NUWC has variety of underwater systems in which data is collected from a variety of sensors such as hydrophones, magnetic compasses, and strain gage sensors. The data needs to be collected from the sensors and transmitted to the receiver via an optical data link. The system must provide power to itself and sensors requiring power (usually the environmental/digital sensors) using a base station power supply. A two wire system should be used for the power. The system should allow for graceful degradation. The loss of one component should not shutdown the entire system. The system should provide some Performance Monitoring Fault Location (PMFL) capability (i.e. getting data from X sensors). NUWC has expertise in this area and is willing to assist/support the project as required.

Objectives

The objective of this project is to design and prototype (smaller scale, i. e. a couple of sensors) a telemetry system that will collect the data and transmit to the base station.

System Requirements

The system must work in undersea environments and meet stringent reliability requirements. The following is a list of system requirements;

Sample rate: XXX Hertz (TBD)

Number of Sensors: 100

Compatibility with Different Types of Sensors: Hydrophones, strain gage sensors, digital sensors

PMFL Capability: TBD

Graceful Degradation: TBD

System Electronic Noise: Goal, 10 dB under Sea State 0

System Dynamic Range: 100 dB

Operating Temperature Range: -2° to 30°

The following design criteria should be considered in the design of the system:

Minimize cost

Minimize size

Reliability

Undersea Operating Environment

Team requirements

Two electrical engineers and one software engineer. The team should have knowledge of communications, FPGA, analog and digital electronics.

Contract Information

Michael Obara, michael.obara@navy.mil

Tim Straw, timothy.straw@navy.mil

Michael Williams, michael.r.williams1@navy.mil