A sea rescue operation system based on LoRa

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Abstract

Current Personal Flotation Devices (PFD), such as life jackets, are equipped with reflective tape and water- activated LED units. As technology advances, it is imperative that safety equipment is enhanced as well This motivates the use of Low Power Wide Area Networks (LPWAN) technology, such as LoRa (Long Range), to allow for easier detection of individuals when disaster strikes at sea. The methodology involves developing a transmitter device, to be placed in a life jacket and a receiver device ,to be placed in a sea rescue helicopter. MultiTech 's range of LoRa enabled modules were used This includes the LoRa mCard, MultiTech MultiConnect Conduit, LoRa mDot and the MultiTech micro developer kit Sensors placed in the life jacket were that of a pulse sensor, water sensor and GPS sensor. It was found that within a 4 km range, the transmitter transmitted data to the receiver within 1.9 ms. The GPS sensor provided the latitude and longitude of the user with an error margin of 7 meters. The pulse sensor produced a BPM value which was 98% accurate compared to the wrist method test of finding ones BPM. Therefore, in this paper, the authors designed and implemented a sea rescue system which depicted how LoRa can be utilized in such an application and shows how it can be used to transfer data from a device attached to a PFD to a receiver placed in a sea rescue helicopter. Hence and so forth, the use of water sensors, GPS sensors and pulse sensors have been attached to a transmitter device found in a life jacket which then transfer live information to a receiver placed in a sea rescue helicopter. The overall aim of the system is to improve the efficiency and effectiveness of current sea rescue operations.