The Design Portal of a Wireless Linked Naval Substation for International Boundary Scanning and Surveillance System

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Abstract

The peninsular regions, islands and the coastal countries have their boundary in the sea, the peoples' livelihood in these countries are fishing in deep sea. Due to carelessness or without knowing the boundary of their country they cross the borders. In such situation the lives of fishermen are at danger. They are usually attacked by the enemy navy and many most of their lives are lost. They are abducted and their boats are captured. Our project is designed to avoid such kind of incidents and alerts the fisherman when they are about to cross the International Maritime Boundary Line

Index Terms—International Maritime Boundary Line Integrated power system; integrated power system Monitoring; Hybrid Network; Channel Access, Shipping monitoring and control, STDMA, etc.,

I. Introduction

To offer an advance security system in the peninsula , island and the coastal countries had their boundary limit in the sea , the people's lives in those types of country has the work of fishing in the sea due to carelessness or without knowing their boundary limit of their country they crossing the borders. In such situation the   lives of fishermen continue to be difficult. If they faced bullets from the Enemy Navy lot they were killed, now they are at the receiving end of attacks by apposite navy. They are being abducted and their boats are being captured. Nowadays people living in coastal areas are loss their valuable life unknowingly. Those peoples shot death by the neighborhood militants, saying that they crossing the borders. So our project is designed to avoid such kind of accidents and to alert the fisherman about the border are design of a three tier intrusion detection system to exploit spatial and temporal correlations of an intrusion to increase detection reliability and to provide quantitative analysis of the detection system in [1]. ais is a system which makes it possible to get precise on-line information from a large area about ships and their movements in [2].

Radio Frequency, any frequency within the electromagnetic spectrum associated with radio wave propagation. When an RF current is supplied to an antenna, an electromagnetic field is created that then is able to propagate through space. Many wireless technologies are based on RF field propagation. The

10 kHz to 300 GHz frequency range that can be used for wireless communication. The TWS-434 transmitter accepts both linear and digital inputs, can operate from 1.5 to 12 Volts-DC, and makes building a miniature hand-held RF transmitter very easy. The TWS-434 is approximately 1/3 the size of a standard postage stamp. RWS-434: The receiver also operates at 433.92MHz, and has a sensitivity of 3uV. The WS-434 receiver operates from 4.5 to 5.5 volts-DC, and has both linear and digital outputs.The TWS-434 modules do not incorporate internal encoding. If you want to send simple control or status signals such as button presses or switch colsures, consider using an encoder and decoder IC set that takes care of all encoding, error checking, and decoding functions. These chips are made by Motorola and Holtek. They are an excellent way to implement basic wireless transmission control. Full duplex or simultaneous two-way operation is not possible with these modules. If a transmit and receive module are in close proximity and data is sent to a remote receive module while attempting to simultaneously receive data from a remote transmit module, the receiver will be overloaded by its close proximity transmitter. This will happen even if encoders and decoders are used. The XBee/XBee-PRO RF Modules are designed to operate within the ZigBee protocol and support the unique needs of low-cost, low-power wireless sensor networks. The modules require minimal power and provide reliable delivery of data between remote devices. This firmware is compatible with the ZigBee 2007 specification, while the ZNet 2.5 firmware is based on Ember's proprietary "designed for ZigBee" mesh stack (EmberZNet 2.5). ZB and ZNet 2.5 firmware are similar in nature, but not over-the-air compatible. Devices running ZNet 2.5 firmware cannot talk to devices running the ZB firmware. The XBee OEM RF Modules interface to a host device through a logic-level asynchronous serial port. Through its serial port, the module can communicate with any logic and voltage compatible UART; or through a level translator to any serial device. Information being transferred between data processing equipment and peripherals is in the form of digital data which is transmitted in either a serial or parallel mode. RS-232 is now widely used for direct connections between data acquisition devices and computer systems. As in the

definition of RS-232, the computer is data transmission equipment (DTE). However, many interface products are not data communications equipment (DCE).

II. SYSTEM MODEL

The overall Block Diagram consists of PC memory unit it stores the different driver image. FDS (face detection subsystem) is used to detect the face of the driver and compare it with the predefined image. If the image doesn't match then the information is send to the owner through MMS. Owner can trace the location through GPS. This system owner can identify the theft image as well as the location of the car.
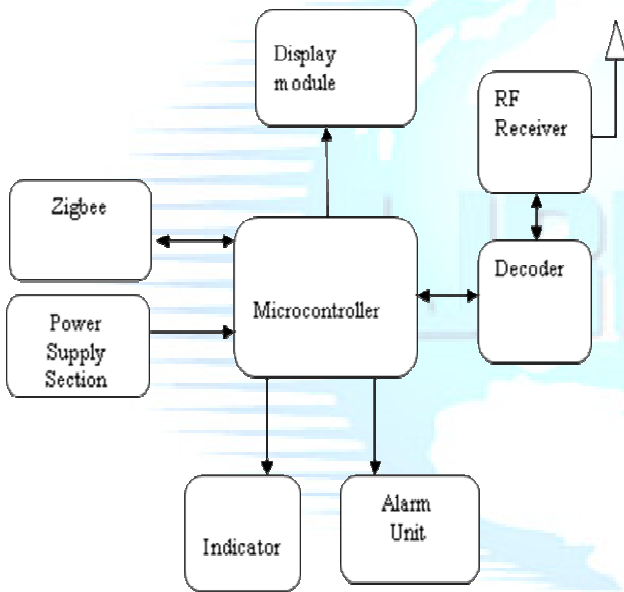
A. Boat Section

FIG2.1 BOAT SECTION

As shown in fig2.1, Power supply is used to give the power to whole scenario, range of power in between of 5V to 12V DC supply. Microcontroller is going to play the vital role, purpose of controller is based on input signal it's going to controller the output peripherals like display units, wireless transmitter messages, and etc., GPs tracker sending and receive the location details with the micro controller and to the navy section. Zigbee is the one type of Tran's receiver, that wireless equipment is used here as wireless transmitter. This kind of wireless equipments can send only hexadecimal value code only, it's not readable by the intruders. So without mediator it is not able to communicate with microcontroller that is why here encoder doing that work. Microcontroller of output peripherals are ignition control, Alert section, Display units, as well as with wireless transmitter. Working principle should be like follow: if boat crosses the border GPS always send the location to the controller. Controller always checks the present location value with the reference value, that reference value should be programmed inside of the controller. So now easily

the controller can find the border crossing by the boat man. As well as its send the message to the navy then display the warning message in boat side display unit, initiate the signal to ignition control. Simply it's stops the motor section of the boat, so boat will be in safe location and boat man also.

B. Navy Section

Whenever receive AIS message exchange between ship to navy are constituted with STDMA (self organizing Time division multiple Access) data communication scheme.This protocol is depending on precise time synchronization and each slot of data is consisted of 256 bits.slot contains ships identification code,position,speed over ground, navigation status and time stamp.STDMA is depending on the availability of a highly accurate standard of tine reference, like clock pulse of computer hardware. Information being transferred between data processing equipment and peripherals is in the form of digital data which is transmitted in either a serial or parallel mode. RS-232 is now widely used for direct connections between data acquisition devices and computer systems. For proper operation, a pair of encoder/decoder with the same number of addresses and data format should be chosen. The decoders receive serial addresses and data from a programmed 2 12 series of encoders that are transmitted by a carrier using an RF or an IR transmission medium. They compare the serial input data three times continuously with their local addresses. If no error or unmatched codes are found, the input data codes are decoded and then transferred to the output pins. The VT pin also goes high to indicate a valid transmission. The 212 series of decoders are capable of decoding informations that consist of N bits of address and 12_N bits of data. Of this series, the HT12D is arranged to provide 8 address bits and 4 data bits, and HT12F is used to decode 12 bits of address information.
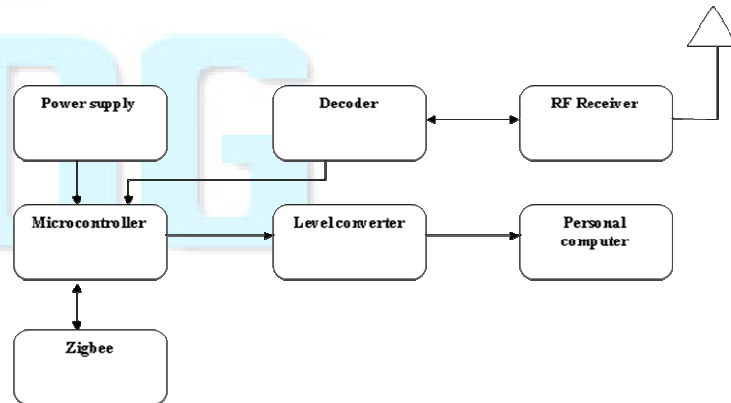

Fig2.2 NAVY Section

C. Sea Section

Whenever In this sea section divided into 3 area (border line).Each area has fixed frequency like 433mhz.In real time system as different frequency in different area. If boat crossed

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fist area, Boat transmitting and Area frequency is matching then message send to the ship section and navy section.The same process has done by crossing the next to border communication with navy and ship section
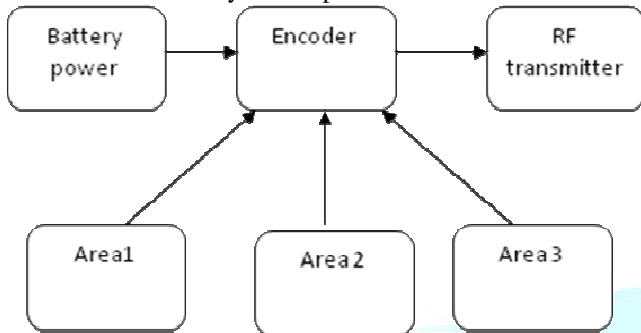

Fig 2.3 SEA Section
TABLE 1

SI NO	BORDER	ACTION TAKEN
1	I	500 metres
2	II	300 metres
3	III	Boat Halt

In this border I defined the distance(500m) between border I and the end of the boundary limit. In this border II defined the distance (300)between border II and the end of the boundary limit. In this border III is the International Maritime Boundary Line ,so the boat is made to stop.
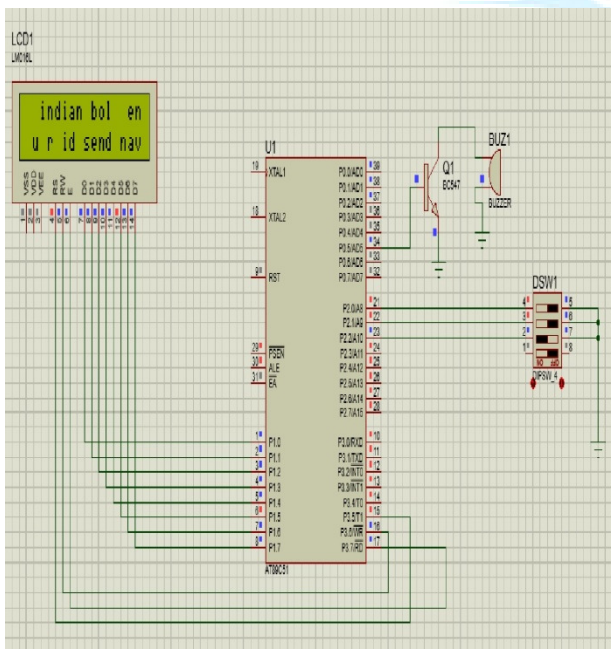
III. SIMULATION OUTPUT

Fig 3.1 proteus output

In this simulation output , when the boat crosses the first border indication is made that the boat has crossed border I and a warning to go back 500m is display in the LCD , Further when the boat crosses II border a indication is made to go back 300m is display in the LCD Finally when the boat crosses the next border III and a intimation is given to the navy personnel and the boat is made to stop.

IV. CONCLUSION

This system used to reduce fisherman burden about boundary scanning and provide alert to fisherman through display and audio systems using wireless technologies. When the boat crosses the first border indication is made that the boat has crossed border I and a warning to go back 500 metres is given, Further when the boat crosses II border a indication is made to go back 300 metres. Finally when the boat crosses the next border III and a intimation is given to the navy personnel and the boat is made to stop.

V. FUTURE WORK

The Future system involves creation of a small network with all the boats in the sea to give warning to the neighbouring in case any boat has crossed the Border.

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