Zigbee Based Communication In TDMA Mode and Aloha Mode For Multiple Transceiver Handling Using Single Channel (Fisherman Life Protection Unit)

Fisherman Life Protection and Status Unit using ARM7 CPU and Zigbee

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Abstract - fishermen sail on small boats for fishing. once they away from shore there will not be any communication. if something happen to them suddenly how could they communicate to the people at shore?. So they can using this handheld unit they can inform to seashore using latitude and longitude values. This unit have two modules one is handheld terminal (Reporting terminal) other one is seashore terminal (DATA SERVER). handheld terminal is at fisherman and seashore terminal is at seashore. Handheld terminal has mainly two modules one is GPS module and another one is RF Transceiver module(ZIGBEE), and also have one rescue alert button, one buzzer. The main theme of this module is if boat is crossed the fixed boundary area then using GPS module (through latitude and longitude values), the buzzer will ringing and also that position will send automatically to seashore module. Rest of time the GPS position is automatically sent to seashore unit at fixed interval of time. The rescue alert button is used to send the alert indication to seashore unit. If unfortunately the boat is sinking then fishermen are waiting some time using air jackets till the coast guard is reached. If unknown persons are entering to our boarder then fishermen can press the rescue alert button to inform to coastguard. Seashore unit is used as server for all fishermen handheld units. seashore unit always receive messages from fishermen units, and display the hand held ID and GPS position. If seashore unit receive messages like out of boarder or rescue alert messages the buzzer ringing automatically then coast-guard will go to sea and protect fishermen from that rescue.

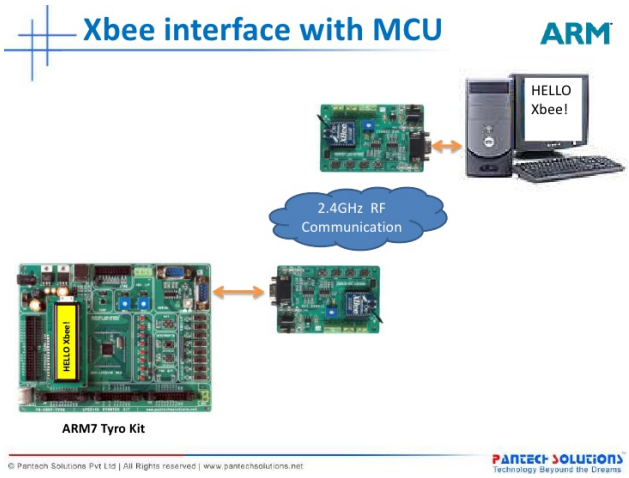
Keywords:ARM7 processor, keil u vision. serial comm application.

I. SYSTEM MODEL

The ARM7 processor, zigbee communication system contains for mainly for fisherman life protection unit having 2 modules mainly one is handheld unit and another one is seashore(data server) unit. the handheld unit contains one GPS module, ZIGBEE module, buzzer and two switches. Another unit named as seashore unit (DATA SERVER) contains mainly one zigbee, one buzzer and personal computer.

Handheld unit is in hands on fisherman if anything happen in boats he can press rescue alert button then that message transmit in aloha mode immediately rest of time the position messages always transmitting in time slot (TDMA). Fisherman can also press another key that is un authentication person entering into the boarder.

Another usage is if fisherman crosses the sea boarder then the buzzer rings automatically and that position message transmits automatically to seashore unit. If the seashore unit receives that message then there buzzer also rings automatically, then coast guard can alert for particular unit ID.



II.PREVIOUS WORKS

Zigbee communication is used previously but I am using effective zigbee communication using GPS module in TDMA and ALOHA modes according situation.

III.PROPOSED SYSTEM FEATURE

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Specifications & Features:

- ☐ Two zigbee modules, one GPS module, with LPC2148 @ 5V DC
- ☐ Status of vehicle using ID number
- ☐ Long distance communication using external amplifiers.
- ☐ Personal computer for information data.
- ☐ GPS module for position tracking
- ☐ Low power consumption
- ☐ Handheld module for easy to handling.
- ☐ Buzzer for out of boarder indication.
- ☐ Operating voltage – 12 or 5V
- ☐ Operating current – 400ma (Approx)
- ☐ Diode protection for reverse polarity connection of DC supply to the PCB
- ☐ Onboard regulator for regulated supply to the kit
- ☐ Extremely easy to install
- ☐ ARM7 TDMI-S vCPU based design for greater flexibility

The System suitable for below applications:

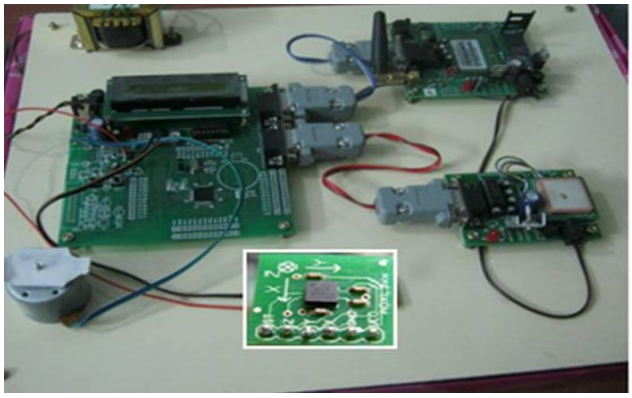
1. Security Systems on boarders
2. Automatic position identification using GPS
3. Automatic monitoring system;
4. Pumping Stations, Tanks, Oil or Water levels;
5. Control vehicle application;
6. Automation System

7 Route mapping and alert applications.

LPC2148 :

The ARM7 is part of the Advanced RISC Machines (ARM) family of general purpose 32-bit

microprocessors, which offer very low power consumption and price for high performance devices. The architecture is based on Reduced Instruction Set Computer (RISC) principles, and the instruction set and related decode mechanism are much simpler in comparison with micro programmed Complex Instruction Set Computers. This results in a high instruction throughput and impressive real-time interrupt response from a small and cost-effective chip.



Compiler = Keil uvision 4

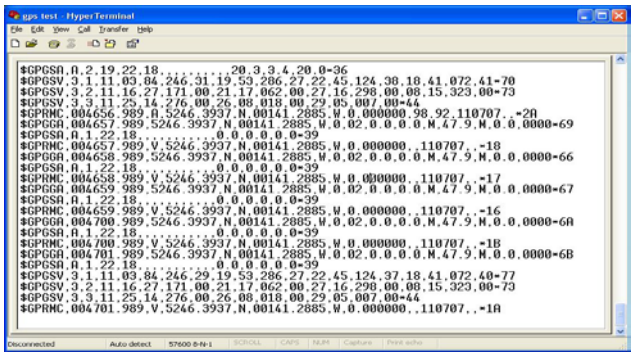
CPU = ARM7TDMI-S

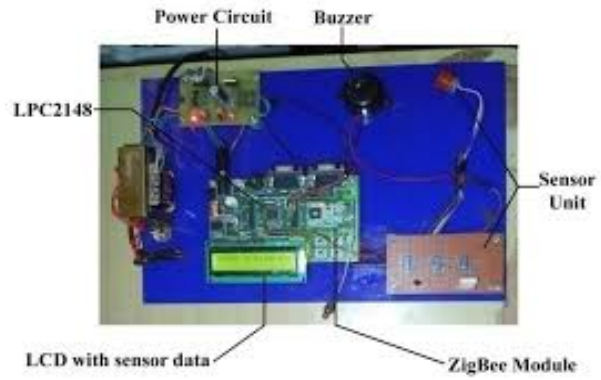
Memory = 512 KB flash

SRAM = 32 KB

USB Memory = 2KB

IV EXPERIMENTAL RESULTS





Power up the full systems:

♣ Main Power supply PWR LED on

♣ On pi board PWR Led should be On

♣ ♣ Wait for 10 to 25 Seconds, for Boot up the systems, Access the system by Zigbee Network

Application

♣ Just open the serial comm application on PC at seashore unit.

♣ observe if the buzzer is ringing at both side.

♣Set baud rate and PORT number on serial comm app.

♣ press the rescue alert button if anything happen on boat

♣ Press the un authentication button if any person entering to our boarder.

Buzzer:

If the buzzer is ringing at any side then observe what is happening both sides. If it is happening on boat then the fisher man sailing crosses boarder indication then he should come backside. If the buzzer is ringing at seashore side then there three cases 1. fisherman crosses the border. 2. Fisherman in rescue. 3. Un authorized person enter into our border.

V CONCLUSION

.Handheld unit is in hands on fisherman if anything happen in boats he can press rescue alert button then that message transmit in aloha mode immediately rest of time the position messages always transmitting in time slot (TDMA). Fisherman can also press another key that is un authentication person entering into the boarder. Another usage is if fisherman crosses the sea boarder then the buzzer rings automatically and that position message transmits automatically to seashore unit. If the seashore unit receives that message then there buzzer also rings automatically, then coast guard can alert for particular unit ID. If the buzzer is ringing at any side then observe what is happening both sides. If it is happening on boat then the fisher man sailing crosses boarder indication then he should come backside. If the buzzer is ringing at seashore side then there three cases

1. fisherman crosses the border.

2. Fisherman in rescue.

3. Un authorized person enter into our border.

VI. FUTURE SCOPE

For Future, up gradation of the system is made possible with use of octa core processor arm11 ..Simulation can be done yielding more hybridization of combinational results. with advanced innovations & market avialabilities made

choice of selection priority. With advanced route mapping technology.

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