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Characterization of an Underwater Positioning System Based on GPS Surface nodes over IOT Using RF Technology

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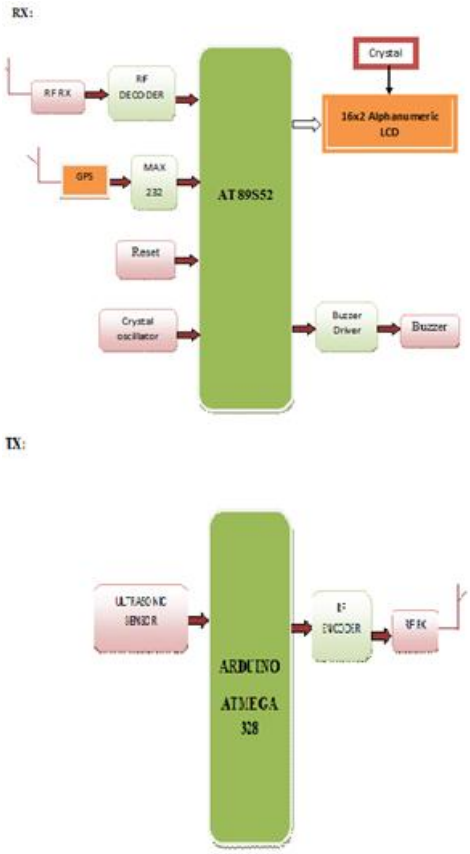
Abstract:
We are implementing GPS technology for detection of submarine in oceans. For which an ultrasonic sensor and RF Encoder is placed in submarine. Whenever submarine detects an inspection ship using ultrasonic sensor it will send RF signal to the inspection ship.

Then, inspection ship detects that signal and decodes it using RF decoder and the location of that ship will be uploaded to the cloud using IOT module. Here we are using Arduino controller at submarine section and LPC2148 as our controller to take the GPS locations and an IoT module is interfaced to the controller to send the location values to other place.

Existing System:
This project describes the design of a simple, low-cost microcontroller Increasing commercial use of the Global Positioning System will soon make it possible to locate anything, anywhere, anytime. The Global Positioning System can provide extremely accurate location information for mobile objects and people which is far superior to earlier tracking techniques.

The challenge today is integrating the necessary components into older systems and improving GPS accuracy in areas with numerous obstructions. As more devices become GPS enabled, accuracy will increase and the system's scale and global reach will benefit everyone.



Drawback:
There is no IOT for updating values on web server.

Proposed System:
Increasing commercial use of the Global Positioning System will soon make it possible to locate anything, anywhere, anytime. The Global Positioning System can provide extremely accurate location information for mobile objects and people which is far superior to earlier tracking techniques.

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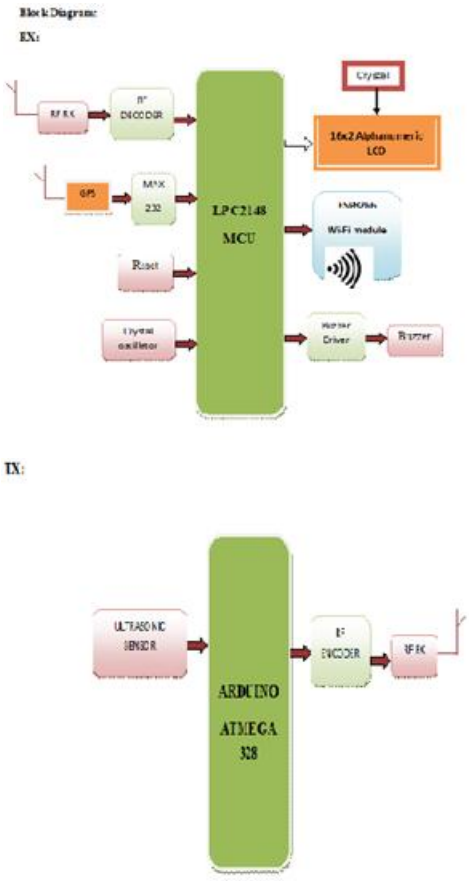
The Global Positioning System can provide extremely accurate location information for mobile objects and people which is far superior to earlier tracking techniques. The challenge today is integrating the necessary components into older systems and improving GPS accuracy in areas with numerous obstructions. As more devices become GPS enabled, accuracy will increase and the system's scale and global reach will benefit everyone.Here, we are implementing GPS technology for detection of submarine in oceans. For which an ultrasonic sensor and RF Encoder is placed in submarine. Whenever submarine detects an inspection ship using ultrasonic sensor it will send RF signal to the inspection ship. Then, inspection ship detects that signal and decodes it using RF decoder and the location of that ship will be uploaded to the cloud using IOT module. Here we are using Arduino controller at submarine section and LPC2148 as our controller to take the GPS locations and an IoT module is interfaced to the controller to send the location values to other place.



Modules used in this project:

The **LPC2148** are based on a 16/32 bit ARM7TDMI-S™ CPU with real-time emulation and embedded trace support, together with 128/512 kilobytes of embedded high speed flash memory. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at maximum clock rate. For critical code size applications, the alternative 16-bit Thumb Mode reduces code by more than 30% with minimal performance penalty. With their compact 64 pin package, low power consumption, various 32-bit timers, 4- channel 10-bit ADC, USB PORT,PWM channels and 46 GPIO lines with up to 9 external interrupt pins these microcontrollers are particularly suitable for industrial control, medical systems, access control and point-of-sale. With a wide range of serial communications interfaces, they are also very well suited for communication gateways, protocol converters and embedded soft modems as well as many other general-purpose applications.

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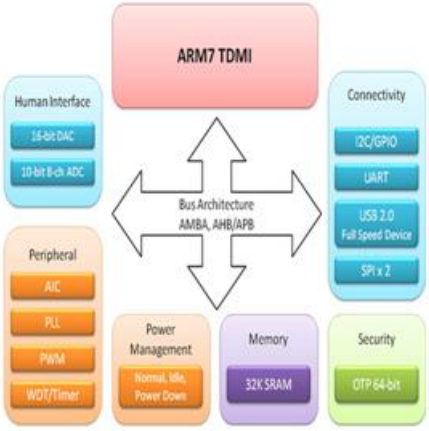
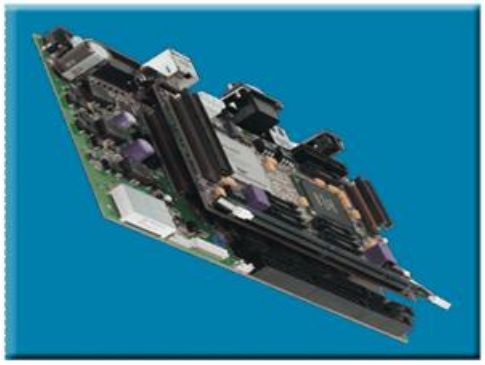


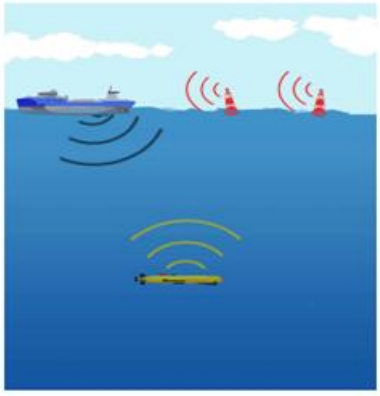
ARM PROCESSOR:



ARM7TDMI Processor Core:

- Current low-end ARM core for applications like digital mobile phones
- TDMI
  - T: Thumb, 16-bit compressed instruction set
  - D: on-chip Debug support, enabling the processor to halt in response to a debug request
  - M: enhanced Multiplier, yield a full 64-bit result, high performance
  - I: Embedded ICE hardware
- Von Neumann architecture

Objective indicator of cardiac function. But most people are very difficult to accurately measure the time and his heart rate values. If the heart rate monitor with me, heart ECG.



INTERNET OF THINGS:

Internet is helping people to communicate each other using different applications

Internet of things helps the things to communicate each other using IoT module

ESP8266EX

- The Internet of Things (IoT) is the network of physical objects or "things" embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data.

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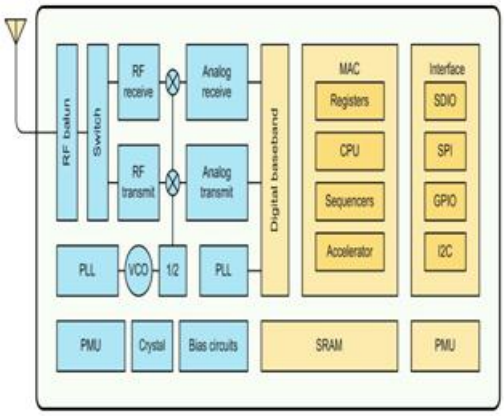
Different Modules

- ESP8266(ESPRESSIF)
- ESP8089
- ESP6203

Wi-Fi Module:

ESP8266EX offers a complete and self-contained WiFi networking solution; it can be used to host the application or to offload WiFi networking functions from another application processor. When ESP8266EX hosts the application, it boots up directly from an external flash. In has integrated cache to improve the performance of the system in such applications. Alternately, serving as a WiFi adapter, wireless internet access can be added to any micro controller-based design with simple connectivity (SPI/SDIO or I2C/UART interface). ESP8266EX is among the most integrated WiFi chip in the industry; it integrates the antenna switches, RF balun, power amplifier, low noise receive amplifier, filters, power management modules, it requires minimal external circuitry, and the entire solution, including front-end module, is designed to occupy minimal PCB area. ESP8266EX also integrates an enhanced version of Tensilica's L106 Diamond series 32-bit processor, with on-chip SRAM, besides the WiFi functionalities. ESP8266EX is often integrated with external sensors and other application specific devices through its GPIOs; sample codes for such applications are provided in the software development kit (SDK).



Global Positioning System:

The **Global Positioning System** (**GPS**) is a U.S. space-based global navigation satellite system. It provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth which has an unobstructed view of four or more GPS satellites.

Advantages:

- Ease of operation
- Low maintenance cost
- Fit and forget system
- No wastage of time
- Durability
- Accuracy

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Applications:

- Military
- Navy Applications
- Local monitoring applications

Conclusion:

Here we have designed a simple, low-cost controller based Underwater Positioning System Based on GPS Surface nodes over IOT Using RF Technology

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