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Water Level Meter for Alerting Population about Floods

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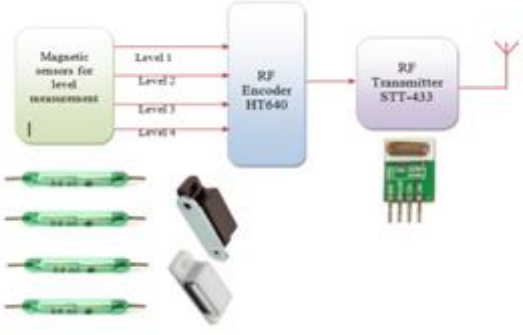
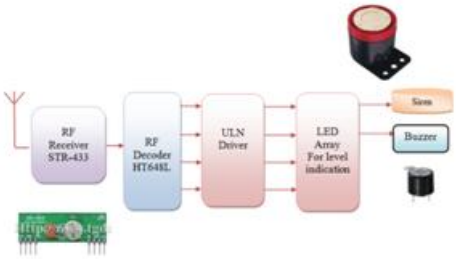
Introduction:

There exist several types of natural disasters, it is known that flood is one of the most dangerous since they have enough destructive power to change the course of rivers, sweep away and destroy whatever is in their path. Our motivation for this work is based on all damages caused in our region due to floods, due to this natural disaster many people has been suffered and damage has occurred to their home and lost their belongings.

Existing System:

We have implemented a unique system for this application by using magnetic sensors. The sensors are fixed at specified locations. A floating magnet floats on the liquid and triggers the magnetic sensors one-by-one based on the liquid level. If the liquid reaches the lower level, it switches the LED ON. Similarly second magnetic sensor is also indicated with an LED. Whenever third magnetic sensor is activated then we are indicating that level with LED and buzzer gets ON. When liquid level reaches to maximum automatically a Siren of 60 dB is activated.





Draw Back

There is no remote monitoring system using IoT module.

Proposed System:

The main objective of this project is to develop a electronics based system, which will detect the level of water and updates using IoT in a real-time basis which offers more flexibility. This system consists of a set of sensors connected through a micro controller. The water level will be analyzed using these sensors and updated in the web server using IoT module connected to the controller. Authorities can view this information using internet from any place and also they can make a decision to divert the people from that place, this is to avoid further complications. A buzzer alert and a siren alert will be given to indicate the severity of the water level.

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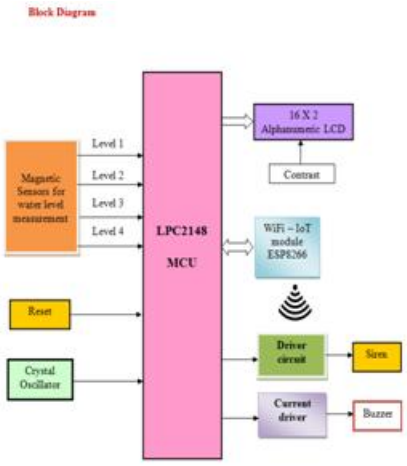
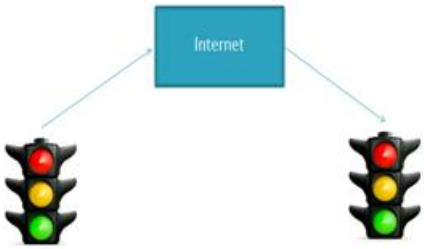


INTERNET OF THINGS:

Internet is helping people to communicate each other using different applications



What if I want to communicate Things

Each other using Internet?

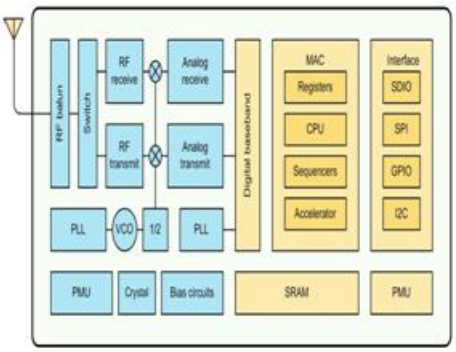
Internet of things helps the things to communicate each other using IoT module

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.

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).

Features

- 802.11 b/g/n
- Integrated low power 32-bit MCU

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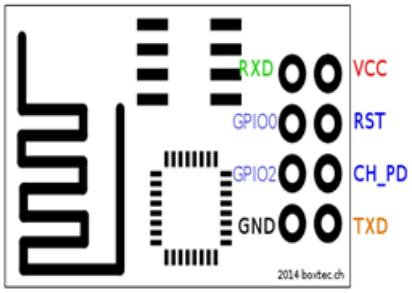
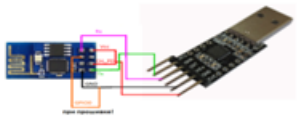
- Integrated 10-bit ADC
- Integrated TCP/IP protocol stack
- Integrated TR switch, balun, LNA, power amplifier and matching network
- Integrated PLL, regulators, and power management units
- Supports antenna diversity
- WiFi 2.4 GHz, support WPA/WPA2
- Support STA/AP/STA+AP operation modes
- Support Smart Link Function for both Android and iOS devices
- SDIO 2.0, (H) SPI, UART, I2C, I2S, IR Remote Control, PWM, GPIO
- STBC, 1x1 MIMO, 2x1 MIMO
- A-MPDU & A-MSDU aggregation & 0.4s guard interval
- Deep sleep power <10uA, Power down leakage current < 5uA
- Wake up and transmit packets in < 2ms
- Standby power consumption of < 1.0mW (DTIM3)
- +20 dBm output power in 802.11b mode
- Operating temperature range -40C ~ 125C
- FCC, CE, TELEC, WiFi Alliance, and SRRC certified

Pin Definitions



Interfacing with USB UART



AT commands are used to control MODEMs. AT is the abbreviation for Attention. These commands come from Hayes commands that were used by the Hayes smart modems

Important AT commands

- **AT+CWLAP** List all the access points
- **AT+CWJAP?+CWJAP="ssid", "password"** Join Access Point
- **AT+CIFSR** Get IP Address
- **AT+CWMODE?+CWMODE=3** Select the respective mode

Wireless IoT improves performance throughout the enterprise value chain

Wireless connectivity is instrumental in the Internet of Things era and the use of wireless solutions in industrial automation is increasing rapidly at all levels of automation systems. Industrial automation systems utilize wireless communication to connect remote and local facilities and equipment to increase operational efficiency. A wireless automation system contains a mix of network technologies, equipment and systems including enterprise and automation systems, network equipment, control devices and field devices. The most common wireless technologies in industrial automation include cellular, 802.11.x Wi-Fi, proprietary unlicensed ISM radio, Bluetooth and 802.15.4 based protocols such as WirelessHART, ISA100.11a, WIA-PA and ZigBee.

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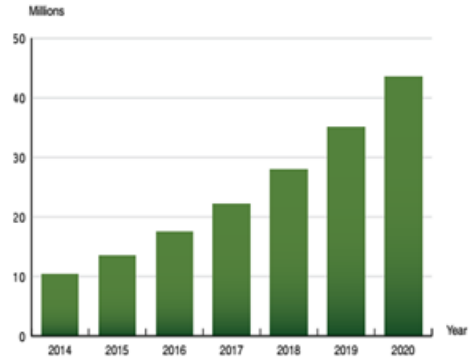
Berg Insight estimates that shipments of wireless devices for industrial automation applications including both network and automation equipment reached 3.7 million units worldwide in 2014. Growing at a compound annual growth rate of 23.2 percent, shipments are expected to reach 12.9 million by 2020. The installed base of wireless devices in industrial applications is forecasted to grow at a compound annual growth rate of 27.2 percent from 10.3 million connections at the end of 2014 to 43.5 million devices by 2020.

Wi-Fi is widely used for backbone communications as well as in monitoring and control applications within factory automation where Industrial Ethernet has got a strong foothold. Bluetooth is also popular – often as a point-to-point wire-replacement between for example a mobile HMI solution and a field device or control unit. 802.15.4 networks are often used to connect wireless sensors and instrumentation in process automation.

Cellular connectivity is typically used for backhaul communication between plants, connecting remote devices in long haul SCADA applications and for third party access to machinery and robots. Most of the major vendors of wireless IoT devices in industrial automation offer a wide range of devices with various wireless technologies in order to support many different applications. Global automation solution providers such as Emerson, GE, ABB, Honeywell, Schneider Electric, Yokogawa and Rockwell Automation are all major providers of wireless solutions to the automation industry.

As wireless solutions have become increasingly popular, more and more major automation equipment and solution vendors are offering wireless technology as part of their solutions. Eaton is a major provider of Wi-Fi and cellular devices for industrial automation applications.



Installed base of active wireless devices in industrial automation (World 2014–2020)

Major fields of ESP8266EX applications to Internet-of-Things include:

- Home Appliances
- Home Automation
- Smart Plug and lights
- Mesh Network
- Industrial Wireless Control
- Baby Monitors
- IP Cameras
- Sensor Networks
- Wearable Electronics

HARDWARE MODULES USED IN THIS PROJECT

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

Software Tools:

Keil compiler is a software used where the machine language code is written and compiled.

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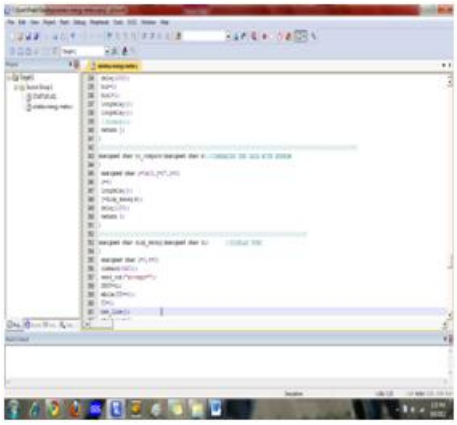
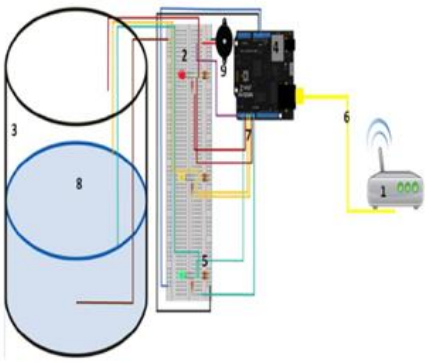
After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keil compiler also supports C language code.



Flash Magic

Flash Magic is a tool which is used to program hex code in EEPROM of micro-controller. It is a freeware tool. It only supports the micro-controller of Philips and NXP. It can burn a hex code into that controller which supports ISP (in system programming) feature. Flash magic supports several chips like **ARM Cortex M0, M3, M4, ARM7 and 8051.**



Water Level Architecture

Monitoring Devices

APPLICATIONS:

Near all water bodies like rivers, oceans, sea

CONCLUSION:

The problems caused by tsunami are large in scale and complex in nature. To deal with these problems. The theme of this project is detecting tsunami with the help of magnetic sensors using wireless technology. One such implementation is IoT based tsunami detection.

References:

[1] D. Giusto, A. Iera, G. Morabito, and L. Atzori, The Internet of Things. Springer-Verlag, 2010.

[2] L. Atzori, A. Iera, and G. Morabito, "The internet of things: A survey,"Computer Networks, vol. 54, no. 15, pp. 2787 – 2805, 2010.

[3] D. Miorandi, S. Sicari, F. D. Pellegrini, and I. Chlamtac, "Internet of things: Vision, applications and research challenges," Ad Hoc Networks,vol. 10, no. 7, pp. 1497 – 1516, 2012.

[4] J. Gubbi, R. Buyya, S. Marusic, and M. Palaniswami, "Internet of things(iot): A vision, architectural elements, and future directions," Future Generation Computer Systems, vol. 29, no. 7, pp. 1645 – 1660, 2013.

[5] W. Kang and Y. Shibata, "Performance Evaluation of Disaster Information System Based on P2P network," in Advanced Information Networking and Applications Workshops (WAINA), 2010 IEEE

ISSN No: 2348-4845
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A Peer Reviewed Open Access International Journal

24th International Conference on, 20-23 2010, pp. 710 – 715.

[6] J. Kim, D. Kim, S. Jung, M. Lee, K. Kim, C. Lee, J. Nah, S. Lee, J. Kim, W. Choi, and S. Yoo, "Implementation and Performance Evaluation of Mobile Ad Hoc network for Emergency Telemedicine System in Disaster Areas," in Engineering in Medicine and Biology Society, 2009. EMBC2009. Annual International Conference of the IEEE, 3-6 2009, pp. 1663 –1666.

[7] S. Saha and M. Matsumoto, "A Framework for Data Collection and Wireless Sensor Network Protocol for Disaster Management," in Proceedings of the Second International Conference on COMmunication System soft WAre and MiddlewaRE (COMSWARE 2007) Bangalore,India. IEEE, January 2007, pp. 7–12.

[8] Y. Shibata, Y. Sato, N. Ogasawara, and G. Chiba, "A Disaster Information System by Ballooned Wireless Adhoc Network," Complex, Intelligent and Software Intensive Systems, International Conference, vol. 0, pp. 299–304, 2009.