СЕКЦИЯ 1. ИНФОРМАЦИОННО-ИЗМЕРИТЕЛЬНАЯ ТЕХНИКА И ТЕХНОЛОГИИ

УДК 681

DESIGN AND ANALYSIS OF LONG RANGE TECHNOLOGY SYSTEM

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LoRa is low power wide area network wireless technology which supports data transmission over several kilometers. Lora technology is based on spread spectrum modulation. There are several technologies such Bluetooth and Wi-Fi but they have range limitation.IOT is having two limitations:

1. It requires internet
2. Range issues.

These limitations of IOT are solved by LoRa.

LoRa system consists of three parts:1. End Node, 2. Gateway, 3. Network server.

1. At End Node, Sensors are interface with Arduino or any other device. LoRa RF Shield will collect the data of sensor.

2. Gateway: Lora RF shield will send data at RF frequency i. e. 868 Mhz to Gateway. Gateway act as demodulator and send its data to PC / Laptop.

3. Network server: It consists of PC or Laptop through which data will be send to server or it can monitor.

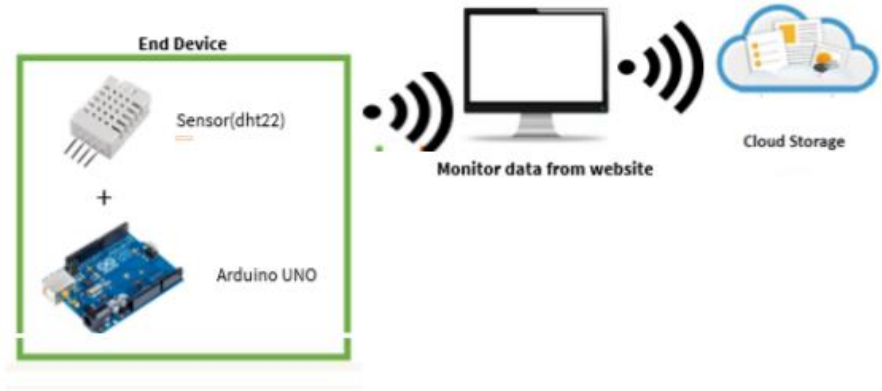

Fig. 1. Block diagram of IOT Technology

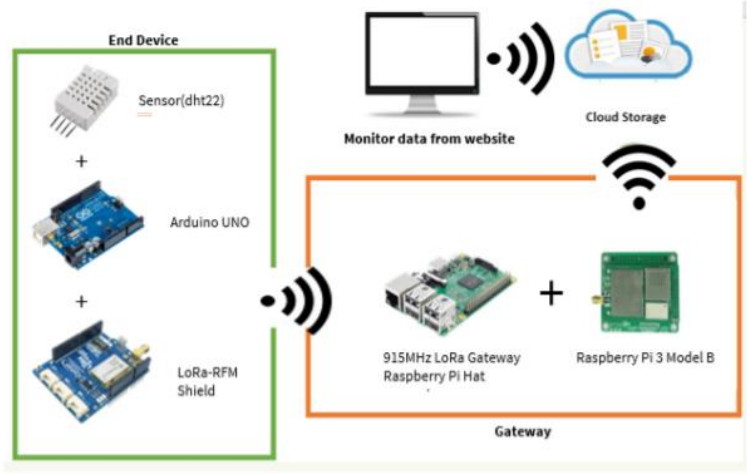

Fig. 2. Block diagram of LoRa

Lora RF Module / Trans Receiver Specifications are as follows:

1. Operating Voltage: 3.3 V.
2. Operating Frequency: 433 Mhz.
3. Half-Duplex SPI communication.
4. Modulation Technique FSK, GFSK, MSK, GMSK, LoRa.
5. Packet size: 256 bytes.
6. Sensitivity: –148 db.

Upto 6 kms of range can be covered by LoRa at data rate of 50 Kbps. In this paper, we are going to design and analyse LoRa System for various applications and going to compare it with other technology.

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HF BAND VEHICULAR ANTENNA WITH NVIS COMMUNICATION

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Antenna plays a vital role in our day today life because through Antenna, signal transmission and reception take place. Information security is one of the key components for military applications. Vehicle antennas work in the L Band, or roughly 1 to 2 GHz, although they need satellites to transmit signals. However, there are restrictions on signal transmission in the ionosphere, such as skip zones. The skip zone is the region in which communication is not possible due to a lack of signal reception. NVIS is therefore used to get around this restriction. NVIS represents Near Vertical Incident Skywave. Low HF frequencies and extremely high radiation angles (> 75°) are used in the implementation of NVIS antennas. It is noted that good radiation efficiency is rarely attained with current research. It reveals errors in the antenna's proper radiation angle setup. A radiation angle that is appropriate lowers the skip zone.

Lastly, in order to improve the characteristics like gain and efficiency, we're going to utilise certain strategies that will improve the antenna's performance. This antenna will work across the ionosphere and be beneficial for transmitting data and voice in military applications.