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DESIGN OF IOT BASED INTELLIGENT CONTROLLING OF APPLIANCES AND PARAMETER MONITORING SYSTEM FOR ENVIRONMENT

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Abstract:

In this project we monitor the environmental conditions or the ambient conditions in indoor houses. Communication between the components of the system is carried out using the existing wireless infrastructure based on IEEE 802.11 b / g. The environmental parameters in each greenhouse can be measured and managed by a remote microcontroller. Measurements of parameters such as soil wetness, Humidity, light intensity, water PH and temperature are applied by sensors. When the sensor value exceeds the threshold value then the device will automatically switch ON based on the input value. Parameter settings can be defined in two ways, i.e. Push button or GPRS remote communication mode. Users can recognize the status of greenhouses or control the system at any time by sending commands through the GPRS network. This data will be uploaded to the server.

Keywords: Humidity, Temp, Gas, GPRS, Devices.

Introduction:

The importance of environmental monitoring is indisputable at our age. This is the first area of the wireless sensors network (WSNs), with the main purpose of being monitored in the physical world and recording the physical quantities of its characteristics. [1]

WSNs are a large network of wireless sensors that have the ability to operate and communicate wirelessly that meet specific program targets in a specific way.

Sensors, they can be used for environmental monitoring, which is a very important topic nowadays, the quality of indoor air is a major factor affecting the comfort, health and safety of occupational building. Finally, using a wireless environment sensor can lead to more efficient building power [4].

The continuing attempts of the economic and social bodies to develop technology to improve energy efficiency and reduce pollution and utilize more of the added infrastructure of national efficiency, together with the need to reduce networking and control costs, has led to the emergence of a new generation of digital systems called Ether (CPS) less than a decade ago. These include network sensors, sensors, actuators, process coordinates, and management services to capture physical data and all the physical impact on this environment, including intelligent decision-making [5]. [6] presented a brief outline on Electronic Devices and Circuits which forms the basis of the Clampers and Diodes. Against this background, wireless sensors can be used to collect body tissues that use more SPP [7]. This will lead to the CPS, the

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composition of the clusters of the processing elements and the broadband or wireless network of sensors and actuators, data collection and environmental impacts [8]. These evolving systems are very similar with the Internet of Things (IoT), which generates global sentiment, which billions of millions of Internet-related objects or anything with emotional, communication, calculations, and potential capabilities creates a partnership, allowing for continuous connections between people and things.

This article shows an environmental monitoring system and surrounding parameters using an internet wireless sensor that transmits data to the server using IEEE 802.11 b / g. Finally, data from around the globe stored on the base station can be viewed remotely from an internet connection. It solves the problem of system integration and interoperability that provide a clear architecture that facilitates the transmission of data from the measuring capability and the efficiency of the monitoring system [10]. So far, Wi-Fi does not exist were taken into consideration when deploying wireless tracking solutions because of their inability to respond to the challenges of such a system. The main problem is dissatisfaction energy consumption. But this changed when new Wi-Fi enabled devices were created and new solutions could take advantage of the many benefits provided by this technology, such as reducing the cost of infrastructure and increasing total cost of ownership. And access to protocols and management tools [11]. In addition, the high bandwidth required in the industry applications can be achieved, and the use of the network is easy in this case and no special adapter is required [12].

Literature survey:

The literature contains a more number of efforts for developing the monitoring solutions that benefit from the advantages provided by wireless sensing technology. Reference [13] presents an automated irrigation system based on the distributed wireless sensor network of soil moisture and temperature sensors that achieves water savings up to 90% compared with the traditional implementations. Sentinella is a smart monitoring solution for assessment of possible causes of power inefficiency at the photovoltaic panel level based on WSNs [14]. The employment of WSNs in smart grid applications and electrical energy monitoring solutions for large buildings was also investigated [15], [16]. A series of industrial WSNs achieving the acquisition of heterogeneous sensor signals, higher reliability levels and higher sampling rates has been developed as well [17], [18]. However, most of the proposed solutions are based on the ZigBee and IEEE 802.15.4 standard applications, and they depend on gateways when the data to be sent to the Internet [13], [16]–[18]. Furthermore, in this case, additional applications have to be developed for encapsulating the data in Internet protocols, such as transmission control protocol (TCP) or user datagram protocol (UDP). Another important technology that provides high power efficiency is Bluetooth Low Energy (BLE), which was firstly introduced in 2010 with a goal of enhancing the use of Bluetooth to power-constrained devices such as wireless sensors [19]. However, much more research work yet to be performed in this

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direction, for finally being able to receive appropriate information from remote BLE-enabled devices requiring small amounts of energy and data communication. Furthermore, for transferring data to the internet gateways are also required. Therefore, the Wi-Fi sensors are used in the system connects directly to the existing IEEE 802.11 b/g infrastructure seems to be a better, low cost and more straightforward solution. This is more beneficial especially for applications deployed in urban areas or indoor spaces, where there is a high probability that access points are present.

Proposed Scheme:

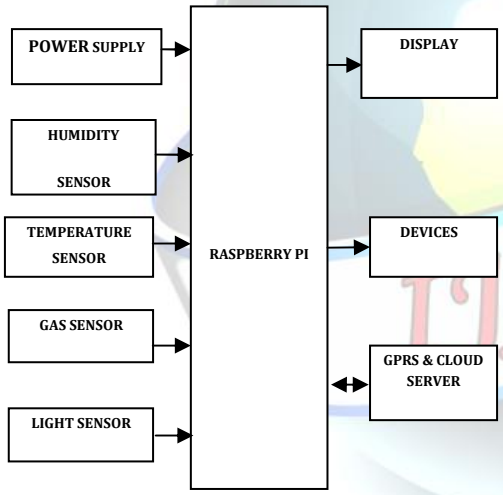

Fig:1: block diagram

Methodology:

Micro controller:

A microcontroller is an entire computer manufactured on a single chip. This portion basically consists of a Microcontroller with its on-chip peripherals like Crystal oscillator with capacitors, ADC ,serial and parallel I/O ports, Reset circuitry, Pull up resistors (if needed) and so on. Microcontrollers are usually dedicated devices embedded within an application which becomes heart of the project because it controls the devices being interfaced and communicates with the devices according to the program being written.

Raspberry Pi 2:

The Raspberry Pi 2 delivers 6 times the processing capacity of previous models. This second generation Raspberry Pi has an upgraded Broadcom BCM2836 processor, which is a powerful ARM Cortex-A7 based quad-core processor that runs at 900MHz. The board also features an increase in memory capacity to 1Gbyte.

Liquid-crystal display:

LCD is a thin, flat panel display device used for electronically displaying information such as text, images. It is an electrically-modulated optical device made up of any number of pixels filled with liquid crystals and arrayed in front of a light source (backlight) or reflector to produce images in color or monochrome. LCDs are a type of light modulating display device. LCD technology does not directly emit light in order to create visualization, it rather modifies the transmission of light to represent images.

Temperature sensor:

A thermistor is a type of resistor with resistance varying according to temperature. The resistance is measured by passing a small, measured direct current through it and measuring the voltage drop produced. There are basically two broad types

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1. Negative temperature coefficient (NTC) used mostly in temperature sensing.

2. Positive temperature coefficient (PTC) used mostly in electric current control.

The TMP 103 is digital output temperature sensor is specified for operation over a temperature range of –40°C to 125°C and it is capable of reading temperature to a resolution of 1°C.

Fig: 2: Temperature sensor

Humidity sensor:

A humidity sensor is a device which senses,measures and reports the relative humidity in a given area.Relative humidity is the ratio of actual moisture in the air to the highest amount of moisture that can be held at that air temperature.The DHT-22 is a low cost high precision humidity and temperature sensor with a single wire digital interface.It uses a capacitive humidity sensor and a thermistor to measure the surrounding air and spits out a digital signal on the data pin so analog input pin is not needed.The sensor is pre-calibrated and doesn't require extra components so you can get right to measuring relative humidity and temperature.

Fig:3: Humidity sensor

Co2 sensor:

A carbon dioxide (Co2) sensor is a small instrument that can detect and measure carbon dioxide within the surrounding air.MQ-3 is a gas/smoke sensor which is sensitive to LPG, Hydrogen, smoke, Methane, Butane and other industrial combustible gases.MQ-303A is a semiconductor sensor for alcohol detection. It has very good sensitivity and fast response to alcohol and suitable for portable alcohol detector.

Fig: 4:Co2 sensor

LDR:

A Light dependent resistor also known as LDR, photoresistor, photoconductor or photocell, is a resistor whose resistance increases or decreases depending on the amount of light intensity. LDR's are a very useful tool in a light / dark circuit. LDRs can have a variety of resistance and functions. For example, it can be used to turn ON a light when the LDR is in darkness or to turn OFF a light when the LDR is in light. It can also work the other way around so when the LDR is in light it turns ON the

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circuit and when it is in darkness the resistance increase and disrupts the circuit.

Fig:5: LDR

GPRS:

General packet radio service is a packet-based wireless communication service that promises data rates from 56 up to 114 kbps and continuous connection to the internet for the mobile phone and the computer users. The higher data rates allows users to take part in video conferences and interact with multimedia website and similar applications using mobile handheld devices as well as notebook computers. GPRS is based on global system for mobile (GSM) communication and complements existing services such as circuit –switched cellular phone connections and the short message services (sms). GPRS also complements Bluetooth, a standard for replacing wire connection between devices with wireless radio connections. In addition to the internet protocol (IP), GPRS supports X.25, a packet-based protocol that is mainly used in Europe. GPRS is an evolutionary step toward enhanced data GSM environment (EDGE) and universal mobile telephone service (UMTS).

Fig: 6: GPRS module

Conclusion:

The project "Design of IOT based intelligent controlling of appliances and parameter monitoring system for environment" has been successfully designed and tested. Integration of the features of all used hardware's has been developed. The presence of each module is displayed reasonably and carefully, thus contributing to the best operation of the device. Second, with the help of a highly complex integrated circuit and with the help of technology being developed, the project is being implemented successfully.

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