



Research Manuscript Title

IOT BASED GARBAGE MONITORING SYSTEM FOR SMART CITY USING CC3200

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ABSTRACT

This paper deals with the detailed framework of IOT based garbage monitoring system in order to make the city clean. Most of the times in our city we see that trash cans are overloaded by the public as a result it leads to unhygienic condition for the people and also create the unpleasant smell. In order to avoid this situation we are going to introduce a project called IOT based garbage monitoring. Here a simple link “internet on a chip” CC3200 is an industries single chip microcontroller (MCU) with built in wifi connectivity. This is used to monitor the level of the waste deposited in the trash bin and gives us information with the help of web server. As per our concern we hope that this paper will be useful for smart city projects and researches.

Keywords: Simple Link Wifi Cc3200 Launch Pad, Smart City, Internet Of Things, Garbage, Trash Bin.

1. INTRODUCTION

The large performance of CC3200 is the industry’s first single chip microcontroller (MCU) with built in wifi connectivity for launch pad ecosystem developed for the internet of things (IOT). A simple link wifi CC3200 device is a wireless microcontroller which integrates a high performance ARM cortexM4 MCU which allows the users to develop an entire application with a single IC with on chip wifi, internet and robust security protocol. The board features on-board emulation using FTDI and includes sensors for a full out-of-the-box experience. This board can be directly connected to PC for use with development tools.

A. Features:

- Wifi development board
- CC3200 single chip wireless MCU(microcontroller unit)
- 40 pin booster pack headers
- Micro USB connector for power and debug
- FTDI based JTAG emulation with serial port for flashing programming
- 8mbit/1MB external serial flash, two buttons and three LED’s
- On board accelerator meter and temperature sensor
- On board chip antenna and clock sources
- 40.0MHz crystal with Internet oscillator

- 4 general purpose timers with 16 bit PWM mode
- 1 watchdog Timer
- 4 channel 12bit ADC,256 KB RAM

B. Booster packs:

Make it simple to develop a diversity of products. And they plug directly into the 40 pin headers available at the CC3200 Launch pad. It includes displays, audio storage positioning motor control, prototyping and more.

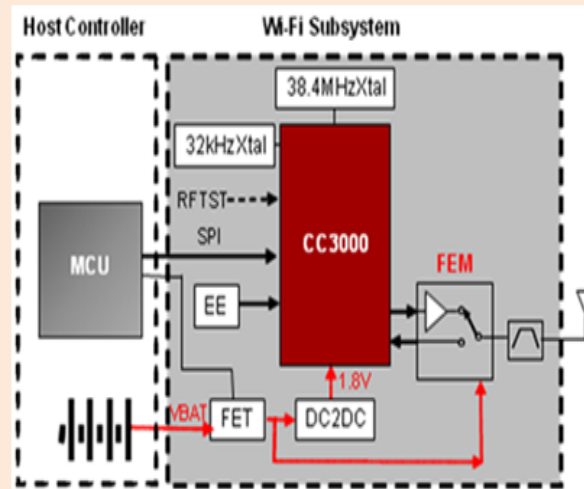


Figure.1 Boost Pack CC3200 Launch Pad

2. SOFTWARE TOOLS

Code composer Studio, Cloud integrated development environment (IDE), IAR Embedded Workbench. It is used to check for consistency and accuracy of custom board designs and in is also includes reference schematics fills of material as well as Gerber files

3. APPLICATIONS

For Internet-of-Things applications, such as:

- Cloud Connectivity
- Internet Gateway
- Home Automation
- Industrial Control
- Home Appliances
- Smart Plug and Metering
- Access Control
- Wireless Audio
- Security Systems

- IP Network Sensor Nodes
- Smart Energy

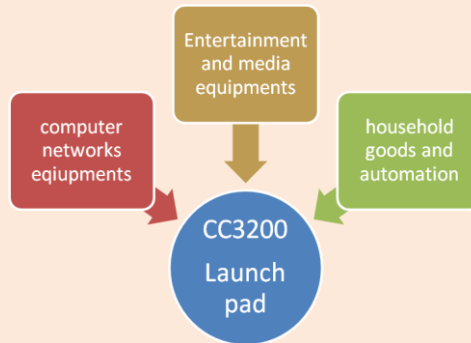


Figure .2 CC3200 Launch Pad Flow Diagram

4. GARBAGE MONITORING

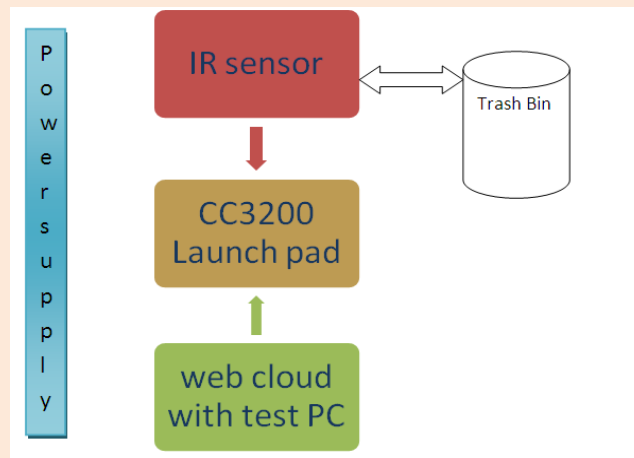


Figure.3 Diagram for Amount of Waste Collected in The Trash Bin

This block diagram monitors the amount of waste collected in the trash bin and gives us information through the web server of PC. IR sensor is used to sense the level of the garbage; whether it is dumped partially or over dumped it monitors completely and gives us the indication. The IR sensor is connected with trash bin by the other is connected with enabled CC3200 Launch pad by which it is programmed and It senses and gives the signal to the web cloud with test PC

A. IR Sensor:

This IR sensor gives indicates the level of garbage filled in dustbin and IR sensor are planted at three different levels on the surface of dustbin to show us the actual level of Garbage present in it. An infrared sensor is used to sense the level in the trash can, whether the garbage is full or not. It consists of an emitter, detector and associated circuitry. The circuit necessary to make an IR sensor consists of two parts

- Emitter circuit
- Receiver circuit

Sense the aspects and detect the motion. This is the basic working principle of IR Sensor

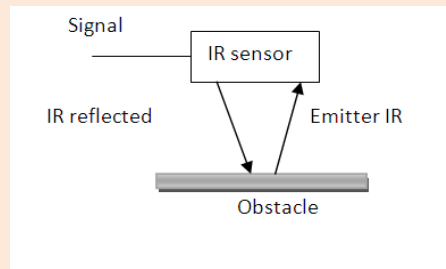


Figure.4 IR Sensor

B. Emitter circuit:

It is simply an IR LED (Light emitting diode), Detector is nothing but an IR photodiode and it is sensitive to IR light of the equal wavelength which is emitted by IR LED. When the IR light falls on the photodiode, its resistance and output voltage, change in proportion to the magnitude of the IR light received.

C. WIFI modem:

The ESP8266 Wi-Fi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. . The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware. The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.

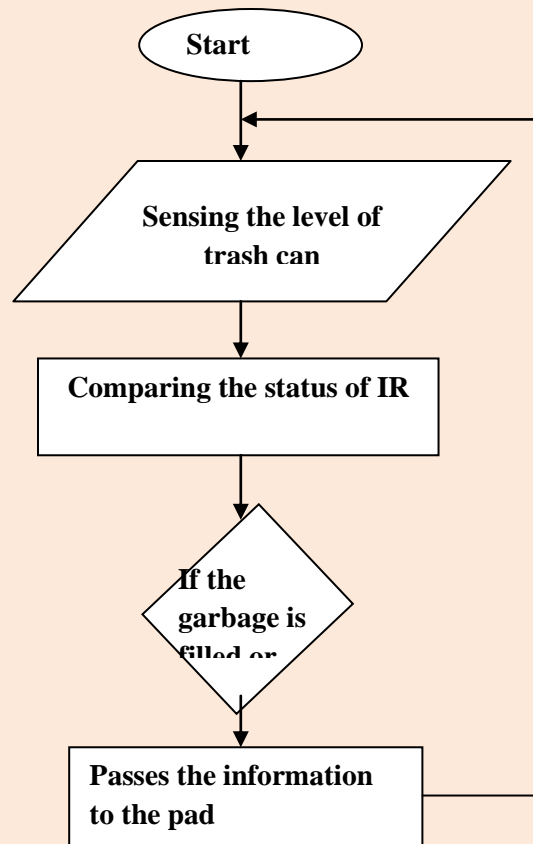
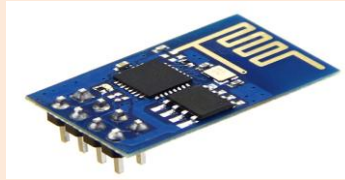


Figure.5 Flow diagram for identify load Runtime.

This module has a powerful enough on-board processing and storage capability that allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime

The following are the results which obtained from this work, Waste Level detection inside the dustbin

- Transmit the information wirelessly
- The data can be accessed anytime
- The real-time data transmission and
- Avoids the overflows of Dustbins



to concerned
and from anywhere
access

Figure.6 Waste Level Detection Circuit.

Advantages of detection circuits: This circuit controls the soil pollution, smart city developmental projects, and majorly reduces the human work.

4. CONCLUSION

We have implemented this project to make the city is clean. In this system smart dustbins can be accessed any where any time by the concern person. In most of the city the garbage collection vehicle visit twice and thrice depend on the population of the particular area but in over system will inform the status of every dustbin so the concern authority can sent the garbage vehicle only when the garbage is full.

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