“Design & Implementation of Smart City Using Controlled Area Network Protocol for Controlling Purpose”

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Abstract—The smart city design means a city is driven technologically. In this we are using various sensors for measurement of pollution, water level, traffic on road, and consumption of electricity in various area in the city. Here we plant for pollution, for water level float sensor MQ sensor, for traffic IR sensor and also camera is used for capturing an image, however for electricity LDR sensor. For eg MQ-7 sensor measure concentration of carbon monoxide gas present in air. We take information from these sensors and send to PIC controller and PIC will send this information to Controlled area network bus. Via the CAN bus this info is send to sub-office for detecting the problem. Also there is corporation office which will get this information by the Global system for mobile and it will decide the solution over that problem occurred in a particular area.

Keywords-- PIC Processor, GSM, CAN protocol

I. INTRODUCTION

The smart city is to made secure & efficient because of all structures. We are using sensors for measuring the reading of different parameters such as water, pollution, electricity. For the measurement of float sensor is used for water level. MQ-7 sensors is used for pollution. IR sensor is used for traffic & LDR sensor is used for electricity. In this we are trying to control these parameters by using the GSM as sending a proper message to the corresponding office related to that parameter. These are interfaced with computerized systems of databases and decision making algorithms.

In this project smart city design means controlling and maintaining the various factors related to the city. The concept of smart cities is gaining increasingly high importance as a means of making available all the services. It aims to increase citizens quality of life and improve the efficiency & quality of services provided by governing entities & businesses.

II. LITERATURE SURVEY

The framework suggests directions and agendas for smart city research and outlines practical implications for the government professionals.

We are using the more number of sensors in one node that require more wiring but we are using CAN protocol for reducing wiring harness. Controller Area Network (CAN) was initially created by German automotive system supplier Robert Bosch in the mid-1980s for automotive applications as a method for enabling robust serial communication.

With the majority of the population living in urban environments today, the concept of Smart Cities has become an urgent necessity. It refers to an urban transformation which, using latest ICT technologies, makes cities more efficient. Composed of a growing Internet of networks, such as the one connecting humans via cellular systems, computers via broadband connections, or objects and sensors via low-cost data links, the greatest challenge today is to meaningfully manage such systems. Given that these systems will greatly impact human lives, issues related to privacy and security have come into limelight.

More than half of the World’s population now lives in urban areas. This shift from a primarily rural to a primarily urban population is projected to continue for the next couple of decades. Such enormous and complex congregations of people inevitably tend to become messy and disordered places. Cities, megacities, generate new kinds of problems. Difficulty in waste management, scarcity of resources, air pollution, human health concerns, traffic congestions, and inadequate, deteriorating and aging infrastructures are among the more basic technical, physical, and material problems. Another set of problems are more social and organizational in nature rather than technical, physical or material. Problems of these types are associated with multiple and diverse stakeholders, high levels of interdependence, competing objectives and values, and social and political complexity. In this sense, city problems become wicked and tangled.
III. PROPOSED ARCHITECTURE

![Image of block diagram]

Fig. 1 Block diagram of system

IV. DESCRIPTION OF BLOCKS

**CAN Protocol:**

CAN means Controller Area Network. CAN is an Asynchronous Serial Communication Protocol. CAN Protocol was designed specifically for automotive applications but is now also used in other areas.

*Features:* Supports 1 Mb/s operation, Implements ISO-11898 standard physical layer requirements, Suitable for 12V and 24V systems, Externally-controlled slope for reduced RFI emissions, Low current standby operation.

*Advantages Of CAN Protocol:* Low connect cost, Lost cost components, Growing number of CAN chips, Increasing knowledge base and integration service base, Wide variety of CAN-based products, Wide variety of off-the-shelf tools available.

**GSM:**

GSM (Global System Mobile) is a digital communication system which has rapidly gained acceptance and market share worldwide. GSM also pioneered low-cost implementation of the short message service (SMS), also called text messaging, allow users to send and receive point to point alphanumeric messages up to few tens of bytes. The GSM standard was developed as a replacement for first generation (1G) analog cellular networks, and originally described a digital, circuit-switched network optimized for full duplex voice telephony. This was expanded over time to include data communications, first by circuit-switched transport, then packet data transport via GPRS (General Packet Radio Services) and EDGE (Enhanced Data rates for GSM Evolution or EGPRS).

**LCD**

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD. Click to learn more about internal structure of a LCD.

V. ADVANTAGES

- Due to this design the supplies provided to the people will be faster.
- If there is any problem related to the electricity, water, traffic, etc then there is an immediate action taken place by government so that people will not suffer from the problems.

VI. RESULTS & DISCUSSIONS

![Image of implementation of components on pcb]

Fig. 1 implementation of components on pcb
VII. CONCLUSION

Thus we have implemented the design of smart city by using the PIC controller and CAN protocol. For controlling purpose here we use GSM technology. By sending the message to the respective control office.

REFERENCES
