

# ACQUIRING BUS INFORMATION USING GSM TECHNOLOGY

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**Abstract :** *The project designed here is very useful for the people who rely upon the public transport for transportation especially on public bus. In this, the bus is equipped with GSM based processor and each bus stop is equipped with data transmitter, so that the passenger can identify at what time the bus has reached a particular stop. Based on this information, the passenger can estimate the position of bus. This information can be known by sending SMS to the GSM which is installed in the bus. This project consists of two bus stops which are equipped with a data transmitting unit each. This unit contains a modulator which is interfaced with microcontroller and the bus stop code gets transmitted. This data is transmitted continuously through IR sensor transmitter. The bus is equipped with a TSOP, RTC, GSM, LCD and Microcontrollers. The real time is read from the RTC by the controller and is displayed continuously on the LCD. Whenever the bus reaches any stop, the code of the particular stop will be acquired through TSOP (IR sensor package) and it will be stored into the ROM of main processing unit along with the time. The GSM module will send the information about the time along with the name of the bus stop to the requested user in the form of SMS. If any passenger wants to know the position of a bus, a SMS should be sent to the concern GSM processor installed in the bus, so the time information will be sent to requested user automatically. Here the system is developed for only two stops, but for implementing practically every bus stop must be equipped with the data transmitter units and every bus with the time processing unit. In this way all buses information can be acquired by sending SMS through mobile.*

**Index terms :** GSM, LCD, RTC, Microcontroller

## I. INTRODUCTION

The main purpose of this project work is to acquire the bus position data through a GSM based time data processing unit installed in the bus. In this method of process, the bus acquires the data when it reaches to the bus stop. As bus stop is identified, at what time the bus has been reached to the specific bus stop, data along with time will be stored into the main processor mobile unit that is installed in the bus. Now whenever any passenger sends SMS to this bus number of GSM module which is interfaced with the processor, the latest information, the previous bus stop information will be sent in the form of SMS to the caller mobile. This helps the passenger in estimating the position of bus. To achieve this, each bus stop must be equipped with data transmitter units, the processor used in the bus stop module is a modulator to transmit the stop data through IR transmitter. For the convenience of the passengers, the time data will be displayed in the LCD present in the mobile bus unit. In addition time data along with bus stop identity will be transmitted through GSM module when it is requested. The system developed here can be used for real time applications when all buses and bus stops are equipped with these kind of processors. Using mobile communication network, position of the bus can be monitored through mobile phone. The main processor that is to be installed in the bus contains TSOP1738, this device known as IR sensor package acquires information from the bus. This data will be stored in to the ROM of microcontroller along with that specific time read from the RTC. As the bus will be moving further, previous data will be erased and fresh data will be acquired and stored, there by the processor sends fresh information always. The mobile unit that is supposed to be installed in the bus is aimed to pass the information to the calling mobile. This data contains the reaching time of a specific bus stop along with the name of the stop and sends this data to the requested user.

## II. EXISTING APPROACH

Real time tracking system has become a field of interest for many researchers. Growing traffic congestion has posed threat to the quality of life of people in many countries over the past few decades. Congestion leads to a decrease in accessibility, travel time loss and air pollution. In developed countries still most of the people use private vehicles. A good public transport is necessary to maintain and improve quality of life by providing mobility and accessibility. Moreover, it helps to secure the environment, brings economic development and increases social cohesion. Predicting onset time of buses is a key challenge in the milieu of structuring smart public transportation systems. In earlier research, an proficient non-parametric algorithm is described which states extremely precise predictions based on real-time GPS measurements. In these approaches, the technological developments of the transportation bodies are still poor, automation of operations is not given importance, Check-in process still follows old methods and Accurate information is not available for the computers.

## III. PROPOSED DESIGN

In this project, two similar types of bus stop modules are constructed.. Each module consisting of a power supply, microcontroller unit, and modulated type of IR signal transmitter. The bus module consists of IR signal receiver, RTC, Microcontroller, GSM, LCD. The information sent by the bus stop module will be received by the bus module through IR transmission.

The function of microcontroller is very important for the bus stop module, it can be said as heart of the project work. The modulator circuit, all of them are interfaced with single chip. The main function of this microcontroller unit is to transmit the bus stop code data continuously through its output pin. This data delivered from pin number 11 is modulated at 38 KHz frequency generated by the 555 timer chip. The time data delivered from the microcontroller is mixed with timer chip frequency and it is delivered through an IR LED. Here modulation is essential, because the IR sensor package used in the bus operates at 38 KHz. When bus stop module delivers the time data at this frequency and where as the main processor used in the bus acquires data at same frequency, the signal delivered from the IR LED will be synchronized with operating frequency of IR sensor package. In this process, the IR sensor package will not accept any other signal present in the air; it accepts only the data delivered by the bus stop module. The data delivered from the IR LED will be radiated in to the air up to some distance,

now whenever the bus reaches to its range, data will be acquired and it will be stored in to the main processor until it receives another data from the another bus stop. As the data is updated, previous data will be erased automatically and the bus carries fresh data. As soon as the code data is received from the bus stop module the microcontroller saves the current time from the RTC and stores both the time and code in its memory.

The GSM used in the main processor functions as transceiver, means it can send data similarly it also receives call from the mobile phone. While enquiring about the bus position, the SIM card (installed in the GSM module) service number must be dialed through another SIM card belongs to any mobile. On receipt of this call, the GSM used in the main processor sends this information to the microcontroller, based on this information the controller sends the bus position data along with time already gathered from previous bus stop.

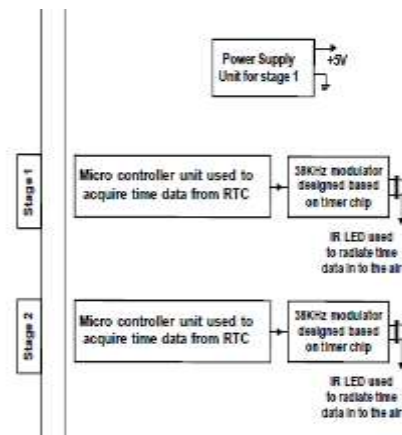


Figure 1 Transmitter module

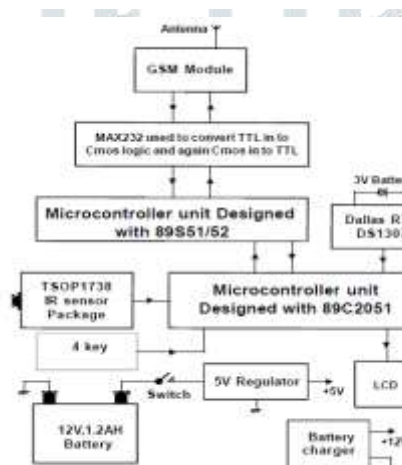


Figure 2 Receiver module

**IV. RESULT**

In this project, the real time information is displayed on the LCD screen and whenever the bus reaches the station 1, the station code is acquired and transmitted through TSOP and stored in ROM along with the time. The reaching time of the bus stop it last left and all previous stop timings will be displayed on the LCD screen as shown if figure 3. Whenever any passenger enquires to know the position of the bus, by sending SMS to the global system mobile communication (GSM) module installed in the bus, information will be passed to the calling mobile automatically as shown in figure 4.

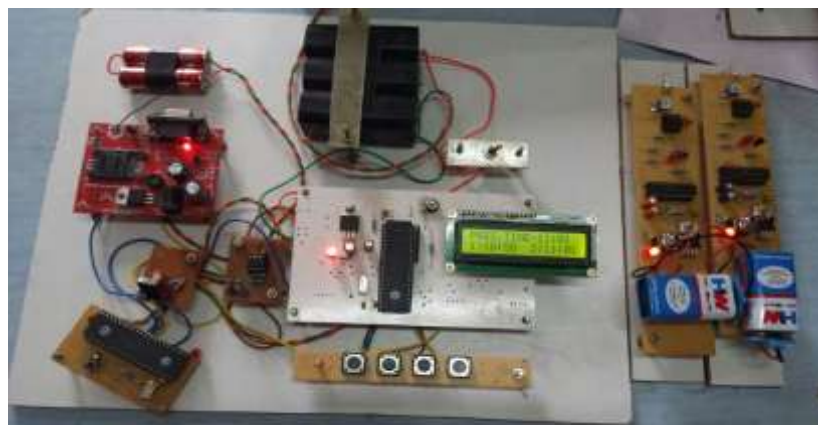


Figure 3: Module installed in the bus

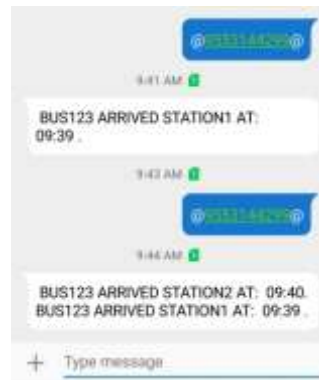


Figure 4: Message received from the bus

## V. CONCLUSION

The project work described is aimed to acquire the bus position data through GSM technology. As the technology advances, particularly in the field of world-wide telecommunication networks, people are expecting improved quality service for various other applications in addition to the personal communications through mobile phones. In this regard, GSM modules are developed which can be used for many applications. When GPS is integrated vehicle position data can be gathered anywhere from the earth, because these devices network covers all most all the corners of the world. Here since it is a prototype module and economy point of view, only two bus stops are demonstrated. And for real time operations this can be enhanced to more number of stations or stops. Using these two devices bus position data can be acquired for the benefit of passengers those who are waiting at bus stops.

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