

Excavator Monitoring And Auto Reporting Using GSM

Swati M. Nagargoje¹, Priyanka D. Kantak², Priyanka N. Tupe³

Professor Mr. Akshay Bhosale ⁴

Department of Electronics and Telecommunication Engineering

Sanjay Ghodawat Institute, Atigre, Maharashtra, India

Abstract - Excavator monitoring system combines the installation of electronics devices in a poclains, tractors, bulldozer excavator with the purpose design to enable the owner to know status of working machine. In the excavator monitoring system Arduino is used as central processing unit for storing the data and then all data send to the owner. Global position system(GPS) technology used for locating the machine. It will track the location of the machine and then this information can be viewed on electronic maps via the internet or specialized software. In this system sensors are used for detecting the exact fuel filling and working hours and Global system for mobile(GSM) is used for sending the information of machine to the owner cell phone. The owner may not get the real information from the operator about the work location, exact fuel filling, work hours etc. several time with wrong input of the work hours given by the operators, because of this the owners are not getting the accurate output in teams of money . So considering these problem the system is to be design for the owner of the machine.

Key Words: Global Positioning System module(GPS), Global system for moile module (GSM), Arduino board , Fuel level sensor and Accelerometer Sensor.

1.INTRODUCTION

Now a days for the owners having several number of excavator machines. In case of constructions, mining, transportation and agricultural work the earth movers like bulldozer, excavator, tractors and poclains plays very important roles. For each machine there is one operator allocated. The major problem faced by the owners is there is no any direct control on the operators of the poclains machines.

The owner may not get the real information from the operators about the work location, the exact fuel filling, work hours etc. several times with the wrong input of the work hours is told by the operator, because of the owners are not getting the adequate output in terms of money. Also several time the operator may not take care of the condition of the machine. Also the owner can not keep watch on their excavator machine, when it moves in different places, therefore malfunctioning with them takes place. If this machine controller by remotely, then owner can catch the

every movements of the machines. Like work location, working hours, ignition status etc.

So considering this problem the system is to be designed for the owner of the machine. This system will monitor the machine and display information like start time, fuel level, work location etc. On the mobile of the owner by sending message using GSM.[1]

2. DESIGN OF HARDWARE SYSTEM

2.1) System structure

In proposed work the system consist of arduino, GSM module, GPS module, LCD and the sensors. The sensor interfaces can be connected to the earthmovers unities for the detection of a variety of status data. The block diagram of terminal board is shown in figure. The hardware structure of the system is dominated by arduino, GPS module and GSM module and other components. This design adapts the current leading GPS technology and the integrated positioning. A GPS receiver module with the high sensitivity, low power consumption and 20 channels solution to help users gain and continuously track GPS signal at a very low signal intensity, which means can be used in the environment where it has never been thought to accessible, such as buildings in the city, dense forest and many indoor environment, with positioning accuracy less than 10 meters. GSM module is used for wireless communication having gained domestic network card of radio equipment, it operates in dual band GSM 900 with a power consumption of 2W and 1W respectively. Through this interface, system can have real time monitoring of earthmovers information, in order to make response timely. The GPS tracks latitude and longitude of earthmover. With the help of multimedia cell phone or PC with internet, we can find exact location of the earthmover equipper with the system. In case of power failure transaction details are retained or stored on to the arduino and available for use when the power supply is resume, and this includes transaction in process at the time of the power failure which are automatically saved. This system is not only useful for control and stop the fuel theft

by the driver but also it restricts the driver to work at another site without permission of the owner.

The GPS use us latitude and longitude, if put this value on Google map on multimedia cell phone it gives us location and through this owner can track the object, when it moves out of coverage area he can also take respective actions.

Transmitter:

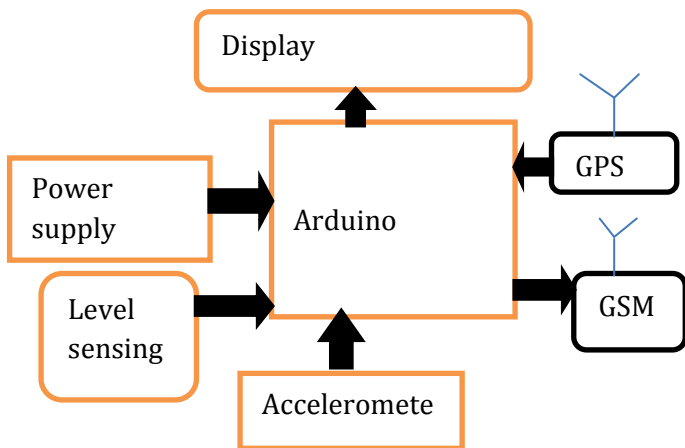


Fig-1: Block diagram of transmitter

Receiver:



Fig-2: Block diagram of receiver

2.2) working

In this project Arduino is a centralize part to which various parts like level sesing, actual work start sensing ,GSM and GPS are connected. The working will be as discussed below.

First the centralize an it is powered by the battery of the particular GCB or the excavator machine. Actually in this case, the working required voltage or arduino is 5v and available power force is a battery having capacity 12v dc. From this 12v the suitable power supply is desigend power supply includes 7805 regulator which receives 12v and generated a 5v regulated output given to the arduino kit. The same power supply source is given to GSM and GPS in this case GPS receives the longitude and latitude of that particular location throught the GSM data will be send or any

command will be received from the owners mobile means owners mobile is directly connected to the arduino though GSM model.In this case depending upon the sitation like when a particular amount is given to the that driver or operator of that GCB machine files the particular fuel anddepending upon the expenditure or fuel level sensor senses exact the fuel level and sme data will be also displayed on display of LCD. System is configured in such a way that after starting exact work in this we are using accelerometer sensor. Normally the particular lades or the jacks attached with excavators are in standard normal position in that case accelerometer gives stedy standard voltage output to its x,yand z direction.Once work is started naturally all the movements of all the parts like loader or the jacks are started in this case certain vibration are created. Particularly there are certain movements and if xyz movement crosses there set limit then definitely it indicates its actual work started, that particular instant will be received and that will be consider as work statrting point. Once all movement gets stop this will consider as that particular stop time is there and machine is stopped as this using this we will get exact for what period machine actually used the same working of our data the perticular fuel level and again exact working lacion data is received and after certain time interval data will send to the onwers mobile through a GSM.

In excavator monitoring transmitter are used for transmit the various type of data of machies, like working hours, working location, and ingition status. GSM are used for sending the all information of machines on owner cell phone shown in figure 1 and figure 2.

3) Result

All the receive information are send by GSM to the owner cellphone as shown in figure 3 shows that GPS Co-ordinates .figure 4 shows ingnition status like machine start or machine stop. Calculate time period between machine start and machine stop indicateds work hours of the working machineNow owner able to know the all information or working machine

Figure 3 and Figure 4 shows the entire result of Excavator monitoring and auto reporting using GSM.Figure 5 show the hardware of excavator monitoring and auto reporting system using GSM.

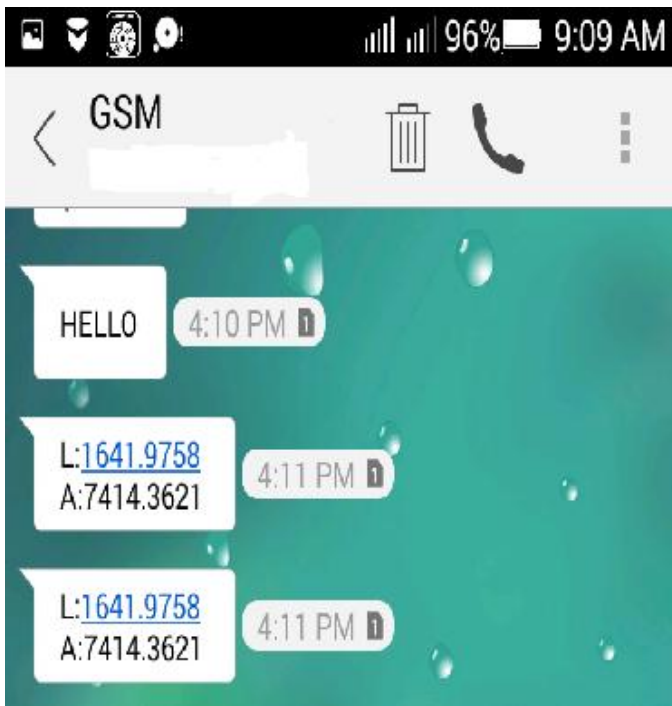


Fig-3: Message of GPS co-ordinates on owner cell phone

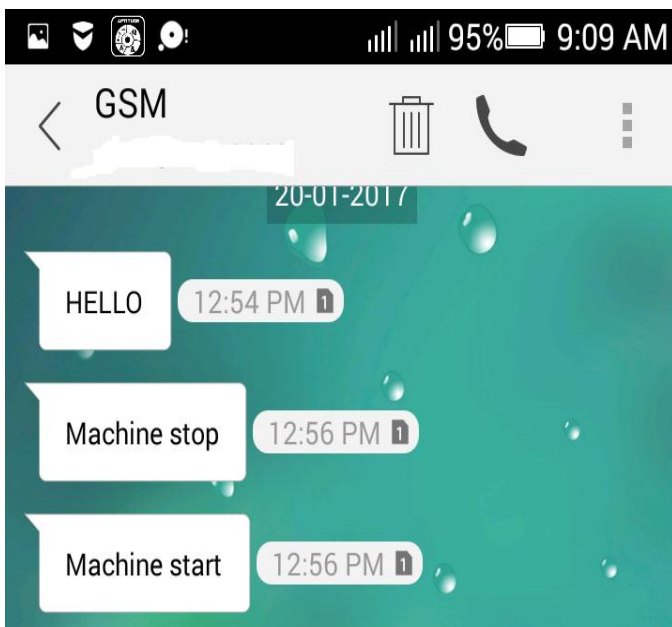


Fig-4: Message of ignition status of machine on owner cell phone



Fig-5: Hardware of Excavator monitoring and auto reporting using GSM.

4)References

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5) Conclusion

The earthmover monitoring system play the important role in remote monitoring and tracing of earthmover, and also gives the record details of work through storing every detail.