Advanced Data logger and tracer for Earthmover and Heavy Machineries

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Abstract- Unifying the Global Positioning system technology and Global system mobile communication with ARM 7 realizes one kind of embedded wireless system named 'ARM Based System for Earthmover's work status monitoring and position tracing using GSM and GPS'. In terms of the hardware completed the design and connection of ARM embedded system, GPS module, different parameter monitoring sensors and the GSM module. The system can achieve the purpose of real time monitoring and real time data storage of earthmovers. The testing results shows that owner of earthmovers can acquire the enough data from vehicle through SMS at any time with locations. That fulfills owner requirements like real time monitoring and also avoid malfunction with his remote earthmovers.

Keywords – Real-time monitoring, Tracking, Onboard Storage, Wireless technology

I. INTRODUCTION

Construction, mining, transportations and agricultural work, the Earthmovers like the Bulldozer, Excavators, Tractors, and Poclains are playing very important roles. These earthmovers have very high initial as well as maintenance cost and due to this there any kind of malfunctioning is not affordable to owners.

The owners of such machineries cannot keep watch on their machineries, when it moves at remote places. There may be possibility of malpractices. If the earthmovers should have the remote monitoring system with on-board storage and any time accessible to owner. Then these malpractices can be overcome. Where owner can access the earthmover status like how many hours did it work? What is the current fuel level? What was fuel level when it was started? And what is the current position of machinery.

II. PROPOSED SYSTEM

A. System at the Machine –

Monitoring systems will be small system inside the earthmovers. And it cannot be accessible to driver. It only alerts to an owner by SMS with various information's and its position. Through this these remote earthmovers will come in the observation of the owner.

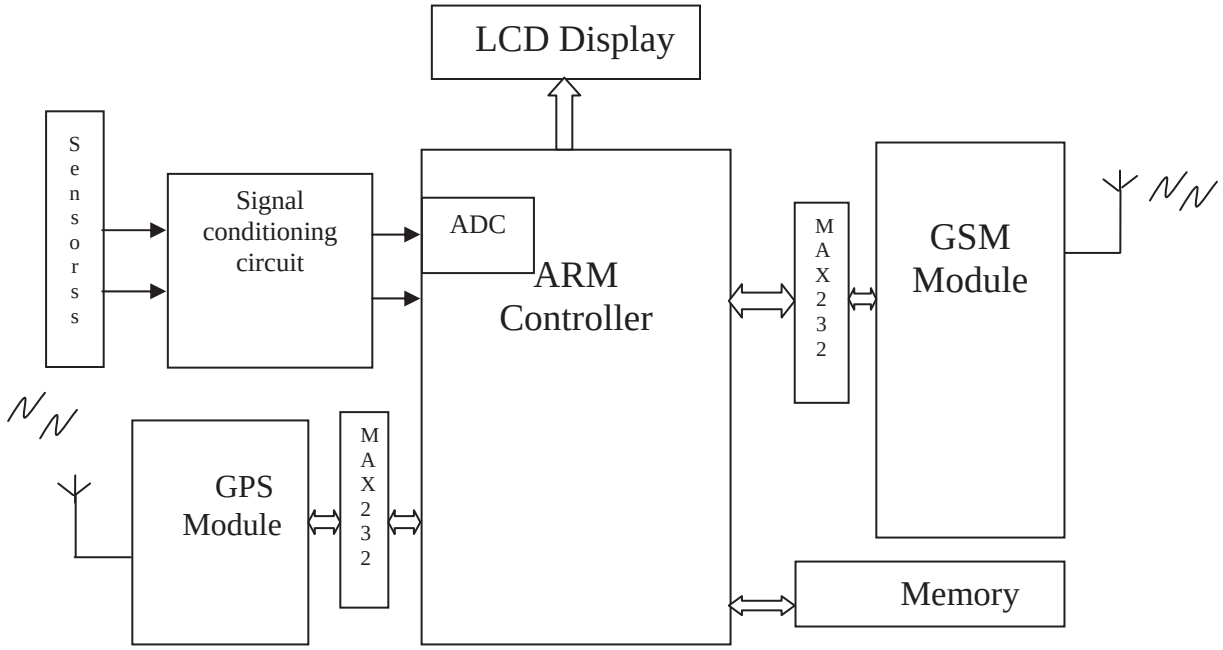

Figure 1. Main block diagram

Figure 2. Pictorial view of Transmitter and receiver Block Diagram

III. EXPERIMENT AND RESULT

Different SMS on Owner's mobile phone.

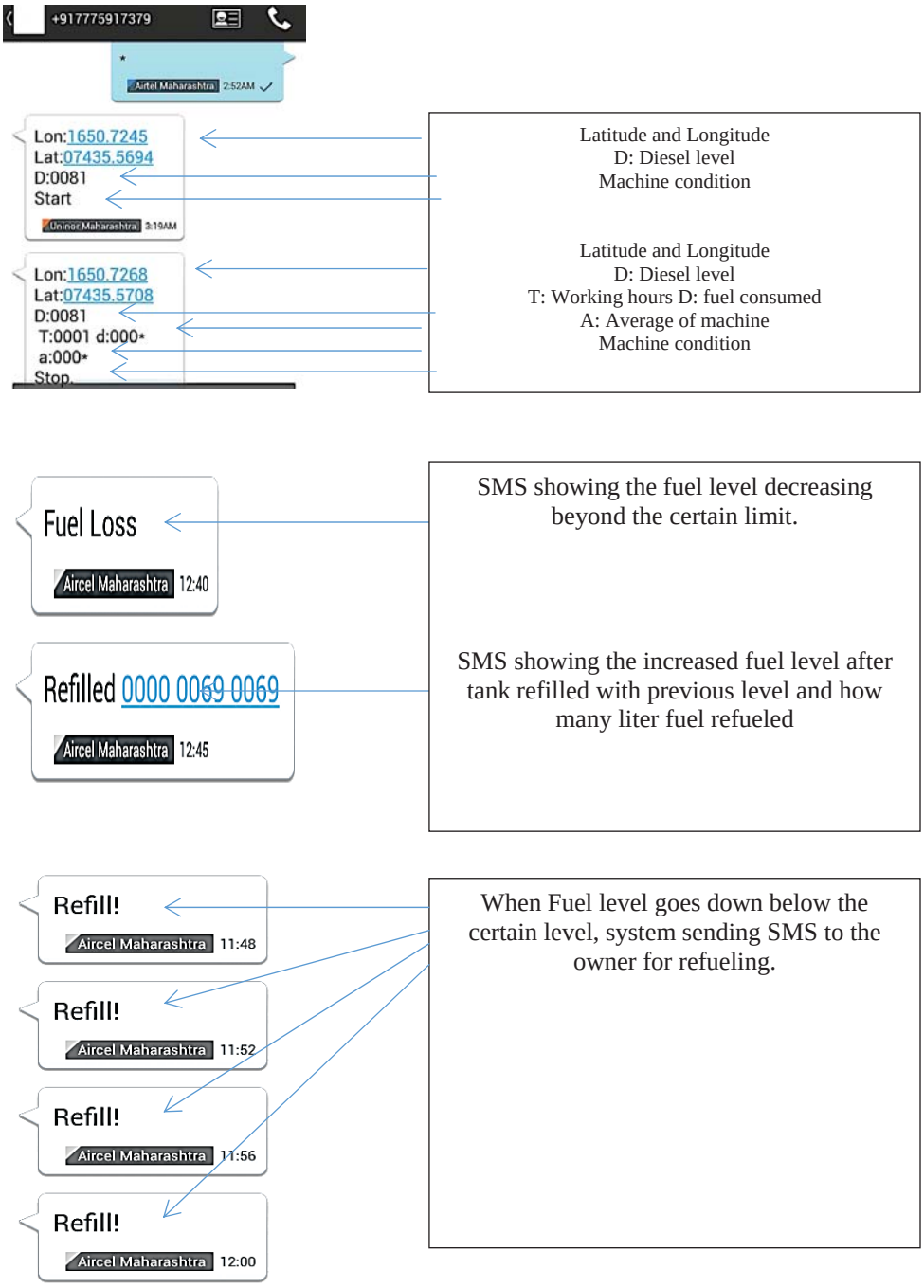

Figure 3. SMS sent by Earthmover System

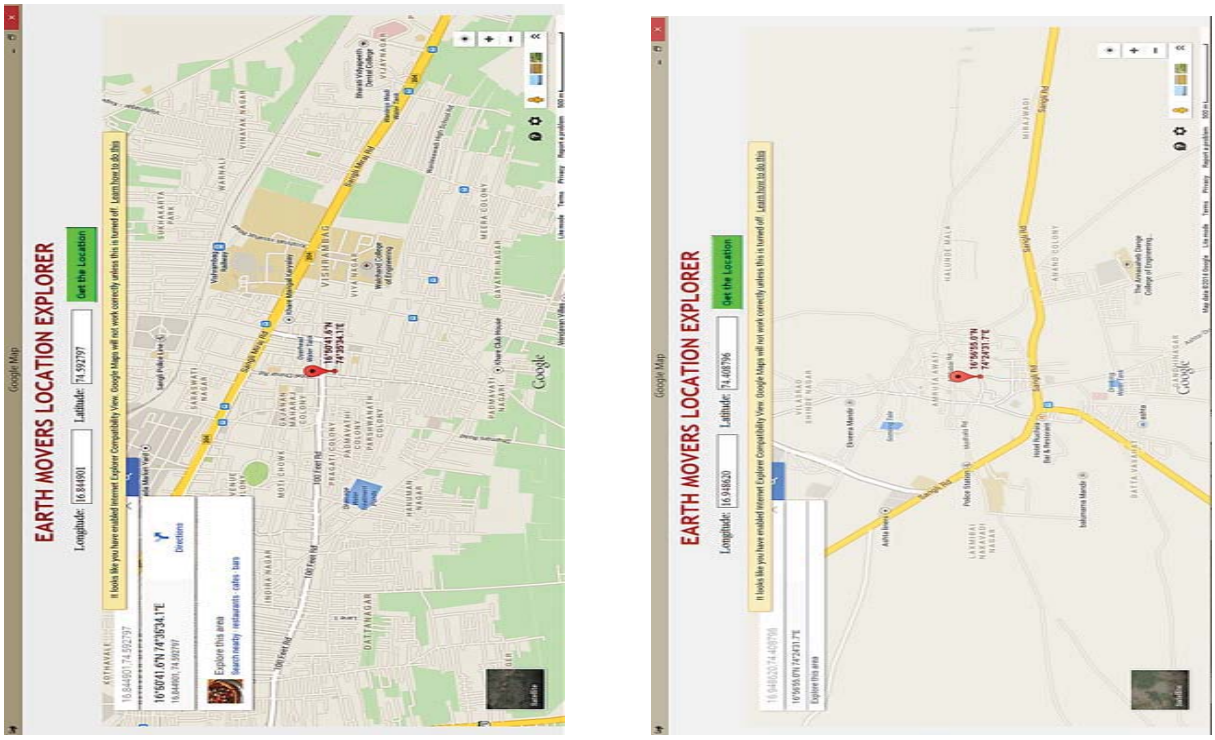

Figure 4. *Earth Mover's Location displayed on Internet Explorer*

Above pictures showing location of the Machine in explorer at onwer PC/Laptop , Below picture showing the data downloaded from machine in MS Access

Erthdata

ID	dwndate	dwntime	latitude	longitude	Disel	remark	Total_Hours
178	29:06:14	19:02:38	1650.7235	07435.5612	D:0057	Start	
179	29:06:14	19:03:07	1650.7227	07435.5624	D:0057	Stop	H: 0 M: 1
180	29:06:14	19:03:44	1650.7202	07435.5633	D:0057	Start	
181	29:06:14	19:04:01	1650.7195	07435.5618	D:0057	Store	
182	29:06:14	19:04:24	1650.7203	07435.5568	D:0057	Stop	H: 0 M: 1
183	19:06:14	19:15:38	1650.7235	07435.5612	D:0057	Start	
184	29:06:14	19:35:07	1650.7227	07435.5624	D:0057	Stop	H: 0 M: 20
185	29:06:14	19:03:44	1650.7202	07435.5633	D:0057	Start	
186	29:06:14	19:04:01	1650.7195	07435.5618	D:0057	Store	
187	29:06:14	19:04:24	1650.7203	07435.5568	D:0057	Stop	H: 0 M: 1
188	11:07:14	14:01:21	1650.7197	07435.5680	D:0000	Stop	H: 14 M: 1
189	11:07:14	14:01:43	1650.7199	07435.5685	D:0000	Start	
190	11:07:14	14:02:12	1650.7216	07435.5692	D:0000	Stop	H: 0 M: 1
191	11:07:14	14:02:34	1650.7200	07435.5700	D:0000	Start	
192	11:07:14	14:02:56	1650.7225	07435.5709	D:0000	Stop	H: 0 M: 0
193	11:07:14	14:03:18	1650.7241	07435.5665	D:0000	Start	
194	11:07:14	14:03:39	1650.7222	07435.5626	D:0000	Stop	H: 0 M: 0
195	11:07:14	14:04:01	1650.7214	07435.5644	D:0000	Start	
196	11:07:14	14:04:01	1650.7214	083432.001	D:0000	Start	
197	11:07:14	14:04:28	1650.7214	083432.001	D:0000	Stop	H: 0 M: 0
198	11:07:14	14:05:03	1650.7220	07435.5623	D:0000	Start	
199	11:07:14	14:05:28	1650.7220	07435.5649	D:0000	Stop	H: 0 M: 0
200	11:07::0	7:1414:0	1650.7220	07435.5649	D:0000	Start	
201	11:07::0	7:1414:0	1650.7220	07435.5649	D:0000	Start	
202	11:07:14	14:04:01	1650.7214	07435.5649	D:0000	Start	

Record: 25 of 63 No Filter Search

Figure 5.Backup of data from EEPROM in MS Access on PC.

IV.CONCLUSION

- Installing this system on Earthmover will give the real time information of fuel level and location at every start and stop.
- All movement can be traced and tracked as it occurs in real-time as to how much fuel is being consumed, making it easier to forecast fuel costs and allowances.

- The vehicle can easily be located through this system and if it is stolen or fuel theft occurs (unwanted change in fuel level) it can be informed through SMS.

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