Logistics Management System Based on Wireless Technology

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Abstract

Logistics management is a supply chain management component that is used to meet customer demands through planning, control and implementation of the effective movement and storage of related information, goods and services from origin to destination. We know that shipment tracking and visibility is very important for logistics and financial interests so we offer both current and historical statuses of individual freight shipments. Updates and records from carrier partners on the status of each shipments can be maintained. Utilization of the electronics equipments will enhance the service quality and ensure faithful delivery with tracking system, so the customer and B2B industry can ensure timely and secure delivery. Features like GPS tracking – using the GPS module will keep the authorities informed about the location. The effective use of keypad password for the door opening ensures security, as the goods cannot be tampered or accessed by others. Besides air conditioning and cooling systems is attached for maintaining temperature as per the requirements of the goods. The major challenges in logistics systems are security issues and untimely delivery of goods. Thus then Logistics management system provides solutions to these common problems encountered during transport of goods. This project will enhance updated logistics system, timely and informed delivery and faithful transport.

Keywords: GPS tracking, Keypad Passwords, Tracking systems, Air conditioning and cooling systems, temperature sensors

I. INTRODUCTION

RFID (Radio Frequency Identification) is known as reliable technology used in real-time tracking of its accurate and fast identification, RFID is applied extensively to improve the logistics management, supply chain operation and asset tracking. The GPS (Global Positioning System) is the most promising technology to acquire the position information in outdoor environments. Always GPS is chosen for tracking of vehicles, assets and staff over a wide geographic area. With simultaneous data received from four satellites and ideal conditions and minimal ionosphere, users can calculate mainly an object's latitude, longitude, and altitude.

Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication, which has rapidly gained acceptance and market share worldwide. This technology is used to send and receive messages from vehicle and centralized monitoring sections in logistics management. GSM technology is very commonly used in any part of the world and it is economical to use. The powerful combination of information and intelligent technologies will advance the supply chain monitoring and management capabilities from the origin to final destination. There have been some related works that are focused on the integration of RFID, GPS, and GSM in certain fields.
To solve accurate consignment and realize real monitoring service in the transport management, the overall framework of the digital logistic management can be proposed as fig. 1.

The system operating procedures consist of three basic stages. Firstly, when the products leave the warehouse and are handed over to transport company, the product identification data can be found by the RFID reader. Meanwhile, the product's departure and arrival information can be automatically registered as well. The transporting information of goods is sent to transport company momentarily the GPS module achieves the message (latitude, longitude, and altitude) of vehicle position; RFID reader detects whether a product data is changed; temperature sensor displays the temperature. All the product information and the combined GPS position information are sent in real time.

II. LITERATURE SURVEY

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III. PROPOSED IDEA

The proposed idea consists of the following block diagram.
The main devices are given below:

A. MAX232

The MAX232 is an IC, first created in 1987 by Maxim Integrated Products, that converts signals from an RS-232 serial port to signals suitable for use in TTL compatible digital logic circuits. The MAX232 is a dual driver/receiver and typically converts the RX, TX, CTS and RTS signals. The drivers provide RS-232 voltage level outputs (approx. ±7.5 V) from a single +5 V supply via on-chip charge pumps and external capacitors. This makes it useful for implementing RS-232 in devices that otherwise do not need any voltages outside the 0 V to +5 V range, as Power supply design does not need to be made more complicated just for driving the RS-232 in this case. The receivers reduce RS-232 inputs (which may be as high as ±25 V), to standard 5 V TTL levels. These receivers have a typical threshold of 1.3 V, and a typical hysteresis of 0.5 V.
B. **GSM Module & GPS Module:**

GSM/GPRS MODEM is a class of wireless MODEM devices that are designed for communication of a computer with the GSM and GPRS network. It requires a SIM (Subscriber Identity Module) card just like mobile phones to activate communication with the network. Also they have IMEI (International Mobile Equipment Identity) number similar to mobile phones for their identification. A GSM/GPRS MODEM can perform the following operations: Receive, send or delete SMS messages in a SIM. Read, add, search phonebook entries of the SIM. Make, Receive, or reject a voice call.

C. **LM35:**

LM35 is a precision IC temperature sensor with its output proportional to the temperature (in °C). The sensor circuitry is sealed and therefore it is not subjected to oxidation and other processes. With LM35, temperature can be measured more accurately than with a thermistor. It also possess low self heating and does not cause more than 0.1 °C temperature rise in still air. The operating temperature range is from -55°C to 150°C. The output voltage varies by 10mV in response to every °C rise/fall in ambient temperature, i.e., its scale factor is 0.01V/°C.

D. **ULN2803:**

![ULN2803](image)

Fig. 5: ULN2803

The ULN2801A each contain eight darlington transistors with common emitters and integral suppression diodes for inductive loads. Each darlington features a peak load current rating of 600mA (500mA continuous) and can withstand at least 50V in the off state. Outputs may be paralleled for higher current capability. The ULN2801A is designed for general purpose applications with a current limit resistor, the ULN28 02A has a 10.5k input resistor and zener for 14-25V PMOS.

E. **LPC2138:**

NXP LPC2138 with 10 MHz Crystal Oscillator (With Boot loader Software). High Performance 32-bit ARM7TDMI-S™ CPU. 512 KB Programmable Flash Memory provides minimum of 10,000 erase/write cycles and 10 years of data-retention. 32 KB Data Memory (SRAM)In-System/In-Application Programming (ISP/IAP) via on-chip boot-loader software. Single Flash sector or full chip erase in 400 ms and 256 bytes programming in 1 ms.

![LPC2138](image)

Fig. 6: LPC2138
IV. FLOWCHART

A. System Operation Flow (Vehicle Section):

![Flowchart Image]

Fig. 7: System Operation Flow (Vehicle Section)
B. Remote Centralized (Monitoring Section):

![Diagram](image)

V. RESULT

We have implemented the system for the logistics management and checked the output of individual kit and all modules using CRO and DSO. The full Project is working and we can trace the location of the logistic vehicle in real time using GSM. The map of the vehicle is shown in the software using GUI. We also can check the temperature of vehicle section at the remote site through GSM interface. The Project is fully functioning and approved by the Project guide.

VI. CONCLUSION

This implementation proves to be very effective in providing security for the goods and also ensures the safety and delivery of goods to respective enterprises. Tracking of vehicle is also effectively done using GPS and GSM technologies. This system is highly useful in the military and defense as it renders excellent security of transported goods thus preventing any misuse and unpredictable piracy. This implementation enhances the entire system service. In future drink and drive may be prevented by embedding alcoholic sensor with the existing structure.

Implementing this project idea for the logistics management will give huge business and it will be a threat for the competitors.

REFERENCES


