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AN EXTENSION OF THE SATELLITE MONITORING LIBERTY GPS SYSTEM FOR THE SUPPORT REQUIREMENTS OF TRANSPORTATION COMPANIES

Summary. In working out the performance principles introduced into the construction and functionality of a Satellite Monitoring Liberty GPS System for vehicles and its possibilities in offering services that improve the logistical processes for transportation companies.

ROZBUDOWA SATELITARNEGO SYSTEMU MONITOROWANIA POJAZDÓW LIBERTY GPS W OPARCIU O WYMAGANIA FIRM TRANSPORTOWYCH

Streszczenie. W opracowaniu przedstawiono zasady budowy i funkcjonowania Satelitarnego Systemu Monitorowania Pojazdów Liberty GPS oraz jego możliwości w oferowaniu usług mających na celu usprawnienie procesów logistycznych w firmach transportowych.

1. INTRODUCTION

In the last few years, we have had to deal with the rapid growth of information in transportation companies. This is a factor in determining the speed in which information is sent, its reliability and the way its passed on. Technological satellite GPS (Global Positioning System), Internet, the cellular telephone network also known as GSM, the minutes of service applied to the wireless WAP (Wireless Application Protocol), and the packet to send GPRS (General Packet Radio Service), the third generation of short-range cellular telephones for the UMTS (Universal Mobile Telecommunications System) are tools which modern companies must rely on greater logistical operations. Innovative solutions have been integrated into the functional system to improve the range of the GPS service used by transportation firm.

The Satellite Monitoring GPS system for vehicles constitutes a response to the growing demands of the buyers, making it possible to determine the vehicles random position anywhere on the globe during a twenty-four hour period. The technology of the GPS system is finding a wider range of applications. Some of these applications are: air traffic control, roadway navigation, railways, naval navigation, agriculture and mining, the exploitation of oil, investigating and management of the environment, telecommunications and the electronic transfer of data.

2. DESCRIPTION OF THE SATELLITE MONITORING LIBERTY GPS SYSTEMS FOR VEHICLES

The Satellite Monitoring System for Vehicles consists of the following elements (fig. 1):

- The tasks of the Satellite Monitoring Station for Vehicles are:
 - Monitoring the location of moving objects and their visualization on an electronic computerized map,
 - the reception of an alarm signal from supervised vehicles,
 - transmission of data to police and private security agencies whose objective is to recover the vehicle or its cargo,
 - accumulating and archiving data.
- Supervision System Center, which store information through the following individuals:
 - The Communication Server – assuring smooth communications between the subscriber and the SSMP Liberty GPS system,
 - The Map Info Server - responsible for a legible presentation of the plans for cities, villages and communities,
 - The SQL (Structured Query Language) Server - this system manages the databases on the type of client/server, storing all the data about vehicles and users,
 - The Internet Server – the Liberty GPS is at the customers disposal, assuring the efficient use of the system by monitoring the vehicle from any internet browser.
- Position Locator – assembled in the vehicle for the user, which is responsible for correcting their location.
- Satellite GPS

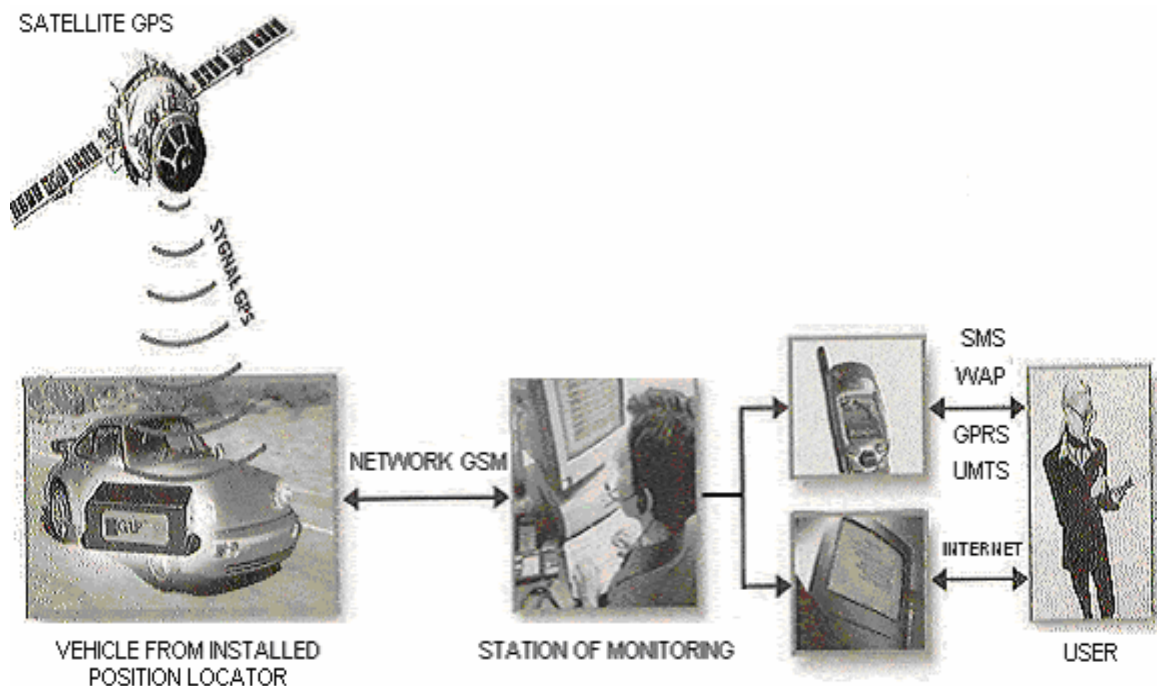


Fig. 1. Diagram of a working satellite system for monitoring the vehicle Liberty GPS
 Rys. 1. Schemat działania Satelitarnego Systemu Monitorowania Pojazdów Liberty GPS

3. FUNCTIONALITY OF THE SATELLITE SYSTEM MONITORING A VEHICLES GPS

The functionality of the Liberty GPS system was created with the actual needs and expectations of potential clients with special attention directed towards two basic groups:

- individuals,
- institutions.

The individual groups that own the Satellite Monitoring GPS System constitute a majority who believe they are effectively protected from theft.

Institutional groups that own the Satellite System Monitoring GPS are firms and enterprises that constitute a diverse working profile. An attempt to work out an efficient informational system for managing the demands of the recipient groups relies on the decisions of a majority throughout the project cycle.

The functionality of the system relies on solutions in two categories:

- location of moving objects in relation to vehicle, which its task:
 - to obtain information for the subscriber about the actual positions of the vehicle with the of SMS, WAP, Internet,
 - to obtain information for the subscriber about the last registered position of the vehicle,
 - to obtain information for the subscriber about the definite route taken by the vehicle,
 - determining the possibilities of routes in the real time (on-line).
- Protection and continuous monitoring of vehicles, which allows for the following possibilities:
 - Authorization from the driver of the vehicle – each entry into the vehicle should be authorized through the execution of specific activities before activating additional buttons e.g., setting of the alarm,
 - Activating the alarm button – in a dangerous situation an alarm procedure activates the Vehicle Monitoring System; the automatic position locator connects within the center and allows them to listen to the situation occurring in the vehicle,
 - Telephone connection – in the event, the driver is removed from the vehicle the system makes it possible to make contact through any telephone; by applying the user name and password the alarm procedure is activated,
 - The use of sensors – the Liberty GPS system makes it possible to connect all the sensors which results in the successful start up of the alarming procedure.

4. THE EXTENSION OF THE SATELLITE LIBERTY GPS MONITORING SYSTEM FOR VEHICLES IS AIMED AT THE IMPROVEMENT OF LOGISTICAL PROCESSES FOR TRANSPORTATION FIRMS

The system was first intended for the users, who wanted to improve the functions of their own personal transportation and to apply up-to-date safety technology into vehicles. The system continues to be developed and modified based on the demand from companies manufacturing cars, and also the private owners who seek effective protection against theft.

In table 1, is shown additional functions about what developments have been taken into account to meet the requirements placed on transportation firms.

Table 1

The extension SSMP in the support about requirements placed through transportation firms

Requirements placed on transportation firms	Introduced modifications
Recording the distance between: - situated vehicles, - situated vehicles and any points on the map	The changes introduced relates to recording the distance of any points on the map
More exact location of vehicles on a map	The changes introduced have made it possible to import file into the system of the map program server
Application for the vehicle location in geographical co-ordinates	The changes introduced relates to the possibilities of recording locations in a text file that includes geographical co-ordinates
The application for vehicle locations from a text file in the system	The changes introduced relates to the possibilities of saving locations of the vehicle in any format of a text file
Simultaneous marking a greater quantity of vehicles	The changes introduced relates to the possibilities of marking all vehicles displayed in one table
The use of new program procedures for the protection of the vehicle	The changes introduced relates to the conformation of the alarm password for the driver
The recording the kilometers traveled	The changes introduced relates to the possibilities of obtaining information about the kilometers traveled.
Remote stopping of the vehicle	The changes introduced relates to the connections of a device authorizing the entry into the vehicle with the antitheft system
Two-way text message information system displayed in the cabin of the vehicle	The changes introduced relates to the uses of a display that sends text announcements to system from the vehicle and receives stored answers from the vehicle to the system

5. CONCLUSIONS

The system presented is an example of a solution aimed at improving the functionality of many transportation firms. These inseparable functions are connected with the protection of vehicles and their cargo these days is inseparable. The system not only concerned with the offered safety services, but it also improves and accelerates their realization in considering the client. Additional benefits of these new possibilities have created more efficient communications and management in manufacturing and monitoring the security of vehicles and their cargos.

The greatest advantage provided by this system is its possibilities for upgrades to met increasing demands of transportation firms.

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