DEVELOPMENT OF ALGORITHM OF THE PROGRAM FOR CONTROLLING DEVICE OF BUSES TRAFFIC SAFETY

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In 2015, a joint team of the departments of technical universities developed a device for monitoring the safety of the bus [1]. The device belongs to public transport and can be used to increase the safety of traffic of vehicles. The task, the solution of which is directed to the proposed invention, is to improve the device for ensuring traffic safety of the bus, by installing in the cab an alarm button of the driver's alertness. The control device for traffic safety of the bus contains: a control unit, GPS, a speed sensor, a traffic light signaling sensor, a speed controller, an alert driver's vigilance button [2].

The bus traffic safety monitoring system works as follows: the driver is controlled by the driver under the general control of the control unit, which monitors the speed and vigilance of the driver, by means of GPS connected to it, speed sensors and determining the prohibition signals of traffic lights; The high-speed mode of the bus is controlled by the control unit, according to the route and the rules of traffic rules with the help of a speedometer; If the driver violates the high-speed mode, the control unit, according to the data of the speedometer, gives a signal to the speed controller, which blocks the acceleration of the bus; The bus route is entered into the control unit, and if the bus leaves the route (it is determined by the sensor), goes to the oncoming lane (determined by the sensor), moves to the sidewalk (determined by the sensor), goes to the prohibiting signals of traffic lights (determined by the sensor), the alarm alert button Driver, which gives a signal (sound and light) in the driver's cabin; At this time, the control unit blocks the acceleration of the bus with its subsequent stop in three seconds, by triggering the brake cylinder; Similar situations for drivers can occur with a deterioration in health (sudden loss of consciousness, clouding in the eyes and other cases in which

he is unable to drive the bus); If the driver is able to drive the bus, then he has the ability to stop the process of blocking the bus acceleration, by pressing the alarm button for three seconds from the moment this process was started [3].

The technical result of the proposed invention is to increase the safety of the bus on the route. This technical result is achieved by introducing the following change in the bus safety monitoring device, the structure containing the control unit, speed controller, GPS, speed sensors and detection of traffic lights prohibitions: in the driver's cab, an alert driver's vigilance button is installed [4] .

To operate the alarm button, an algorithm for the computer program was developed in the Delphi software environment. Delphi is one of the most advanced systems of visual object-oriented programming with features that meet high requirements, which is suitable for creating applications of any complexity [5]. The structure and simplicity of Delphi makes it one of the perfect programming languages and allows you to create with the least effort from simple applications running on a single computer to applications that use server databases located on different platforms. Even an inexperienced programmer will be able to make a Windows application look professional.

Figure 1 shows the main dialog box of the program, where after clicking the "Запуск" command in the welcome screen the following window will open.
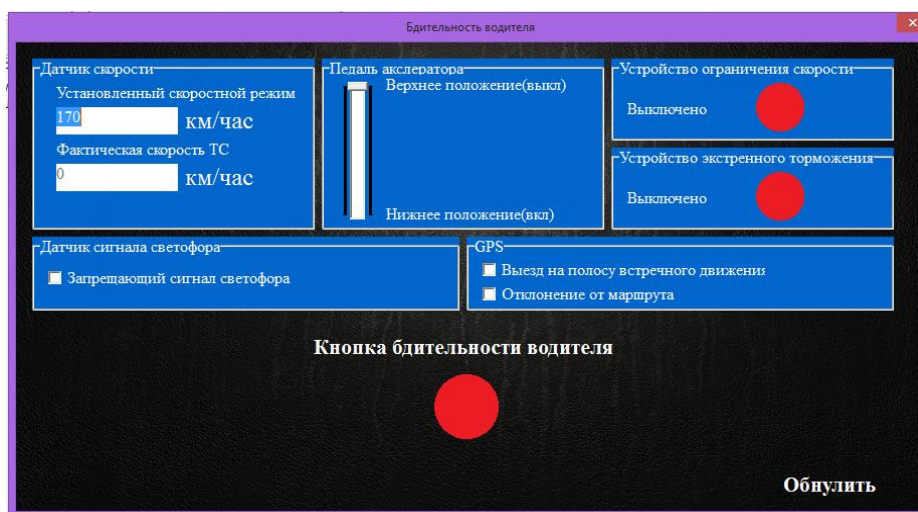

Figure 1 – Main window for starting the device

We will review each part of the program separately. The speed sensor (Figure 2) performs two roles: the first one gives a speed limit on the road and in case the speed mode accustoms reports this further on the program; The second gives a visual display of the speed of the vehicle in the allotted time.

Accelerator pedal - has 2 positions (figure 3): top and bottom or the other on and off. The accelerator pedal controls the speed of the vehicle manually.
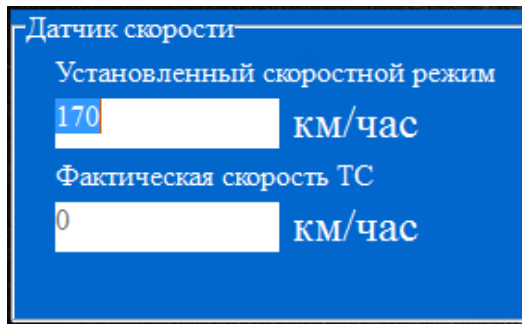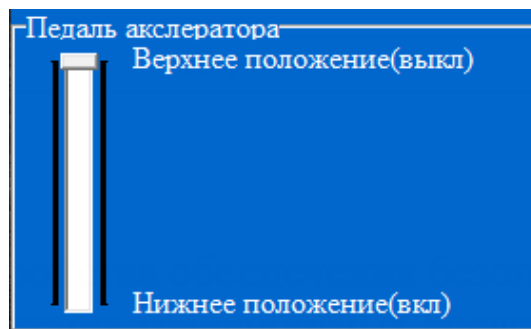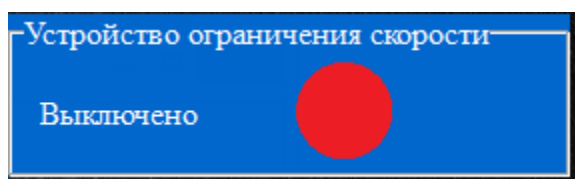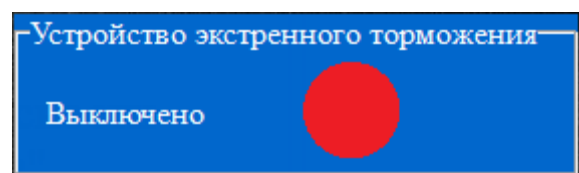
Figure 2 – Speed sensor

Figure 3 – Accelerator pedal

Devices limiting the speed of position (Figure 4, a) triggered by the call of the speed sensor. A signal that the driver is accustomed to the speed goes to this device. The device reduces the speed to the maximum allowed in the set speed mode. There are two indexes: red is off, green is on.

a)   b)

Figure 4 – Devices: a - speed limits; B - emergency braking

The emergency brake device (Fig. 4, b) is triggered when a signal is received to prohibit the signal of a traffic light or to go to the oncoming lane and has two indicators: red - off and green on.

The device monitors the driver's route and transmits the relevant information to the program. The green index lights up when one of the above situations is violated.

The driver must press the driver's vigilance button (figure 5) within 3 seconds to prevent an emergency, otherwise the software will do this.

Figure 5 – Driver's vigilance button

Thus, the developed device can effectively improve the safety of the bus on the route and prevent traffic accidents, reduce accidents on the roads, injuries, loss of life, etc.

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