TECHNOTON

Bus fleet, Latvia

Customer: LLC «Rīgas satiksme», Latvia

Machinery: city buses

Task: fuel monitoring in fuel tanks of buses

Solution: DUT-E S7 fuel level sensors

Result: accurate fuel tank monitoring, automation of documentation

CUSTOMER

LLC "Rīgas satiksme" was founded in 2003 and now is a part of municipality of Riga. Main field of activity is transportation of passengers, maintenance of parking lots, and provision of vehicles for rent. Transport of "Rigas satiksme" runs on 74 routes - 6 tram, 18 trolleybus and 50 bus lines. The company's trams, trolleybuses and buses cover about 45 million km annually

3800+ employees

500+ city buses

140 million passengers transported per year

MACHINERY

The fleet includes buses for city transportation: Icarus, Mercedes-Benz Solaris Urbino and Mercedes-Benz Citaro.

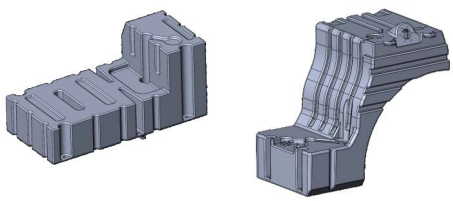
Mercedes-Benz Citaro O530


Mercedes-Benz Citaro O530L

Mercedes-Benz Citaro O530G

Fuel monitoring system was installed on Mercedes-Benz Citaro, O530 models (with two-axles), O530L models (with three-axles) and O530G (three-axle articulated). Maximum passenger capacity is 147 ÷ 177, engine power – 185 ÷ 260 kW, fuel tank volume –200 ÷ 400 liters.

TASK


Bus fuel tanks

Customer had to deal with problem of fuel monitoring in fuel tanks of buses. Accurate data on remaining fuel helps to plan operating hours of bus on the route, place and time of refuellings.

Passenger buses are designed in such a way that passenger cabin has maximum capacity. Place for fuel tanks is chosen "according to leftover principle" - near wheel arches, in the space between sheathing and body panels. It is impossible to mount fuel tank of large capacity with a form of parallelepiped or cylinder there. Therefore, fuel tanks of buses are usually of a complex shape.

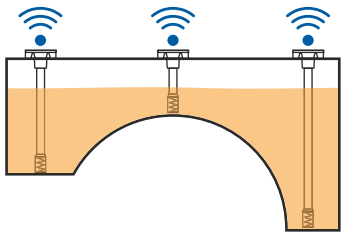
It is impossible to accurately measure fuel level in such fuel tanks using only standard float sensor. Lever of standard sensor cannot move freely throughout the entire height of fuel tank.

Approximate fuel monitoring with an accuracy of "half a tank, give or take" did not suit the customer. So, it was necessary to install accurate fuel tank monitoring system with measurement inaccuracy not more than ± 1%.

SOLUTION

SIA Autonams telematics system provider proposed to install fuel tank monitoring system, based on DUT-E S7 wireless fuel level sensors and telematics unit.

DUT-E S7 measures fuel level in fuel tank with accuracy of 0,1 mm. Fuel data is transmitted using wireless S7 Technology via BLE-channel (Bluetooth 4.X Low Energy) to receiver - telematics unit with BLE. It is also possible to monitor data on the screen of Android smartphone or tablet. Data is transferred without pairing with receiver, simultaneously to several devices - in BLE radio mode.



Three DUT-E S7 sensors in a fuel tank of a complex shape – accurate fuel tank measurement without blind spots

DUT-E S7 wireless fuel level sensor

Installation of fuel tank monitoring system based on DUT-E S7 takes place twice as fast as when installing standard capacitive sensor - there is no need to lay connecting cables behind the sheathing of passenger's compartment. Errors during electrical connection of sensor to telematics unit are eliminated. DUT-E S7 operates without external power supply. Built-in battery provides completely autonomous operation for 5 years.

Each complex shape fuel tank was equipped with two or three sensors. This made it possible to accurately measure fuel volume in such a case. When several sensors are installed in fuel tank, monitoring system provides fuel measurement without "blind spots" – so that, **measurement inaccuracy does not exceed ± 1%, regardless of the amount of fuel in tank.**

Data on fuel volume is transmitted to Teltonika telematics unit and, thereafter, to telematic service − Skybrake vehicle tracking system.

Ilmārs Piebalgs – SIA Autonams, Technoton's partner in Latvia

"To monitor fuel in complex shape tanks of buses, we offered to install DUT-E S7 wireless fuel level sensors. Firstly, installation of wireless sensors takes a minimum time - there is no need to lay a cabling system. Secondly, S7 Technology allows connecting several sensors to a single monitoring telematics unit directly, without using any additional devices. Thirdly, it is possible to monitor fuel not only on telematics service, but also on the screen of smartphone with the help of mobile application."

RESULT

Fuel tank monitoring system, based on wireless DUT-E S7 fuel level sensors and telematics units, was installed on 80 buses. Despite complex shape of fuel tanks, these sensors measure fuel volume with inaccuracy not more than ± 1%, and also determine the amount of fuel filled in.

Data on fuel level in tanks come to Skybrake vehicle tracking system. Manager of "Rigas satiksme" in real-time monitors current fuel remaining in tank of each bus and makes decision on the possibility of further work or necessity of bus refuelling. Skybrake vehicle tracking system allows monitoring fuel in tank (current volume, refuelling/draining). Fuel data is sent to specialized software for automatic drafting of reporting documentation - itinerary and trip ticket, reports for State Revenue Service.

Technical specialist, "Rigas satiksme" *

"DUT-E S7 fuel level sensors are the best option for monitoring fuel in bus tanks. Installation of devices took little time – we didn't have to remove buses from the routes and our company did not suffer losses due to idle time. Accurate fuel data comes in real-time and without interruption. Rīgas satiksme now plans to equip another 220 buses with fuel tank monitoring system. "

** Data is hidden from public access to comply with GDPR requirements.*
Details on the project can be disclosed upon signing NDA and with the consent of our partner.