

Tasks	Design	Installation
Application	Technologies	Configuration
Specifications	Functionality	Business cases
Models	Interfaces	Summary

Tasks



Measuring volumes of fuel tank filling-up and draining



Detecting fuel theft



Monitoring fuel consumption from tank



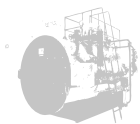
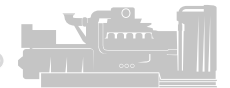
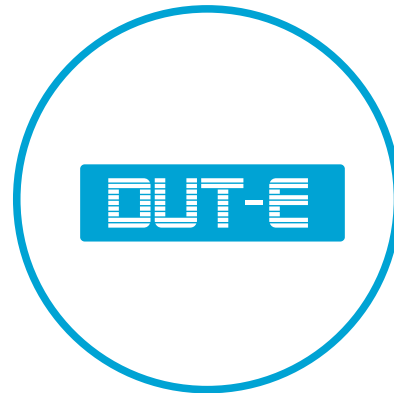
Watch video:
"DUT-E fuel level sensor"



Fuel level sensors

Application

- + Trucks
- + Tractors
- + Railroad machines
- + Boilers
- + Burners
- + Diesel generators
- + Stationary fuel storages





Fuel level sensors

Specifications

Operating principle	Capacitive
Relative measuring error	1%
Sensitivity to fuel level change	0.1 mm
Power supply voltage range	10–50 V
Temperature range	from -40 to + 85 °C
Current consumption, voltage 12/24 V	< 50/25 mA
Current consumption for DUT-E CAN, voltage 12/24 V	< 150/75 mA
Ingress protection rating	IP 55/57



Fuel level sensors

Models

Nominal length of the measuring part (mm):

CAN, 232, 485, AF, I: **350; 700; 1000**



X

Y

L

Type of output signal:

- CAN** – interface CAN j1939/S6
- AF** – analog, voltage 1 - 9 V;
frequency, 500 - 1500 Hz
- I** – analog, current 4 - 20 mA
- 232** – interface RS-232 Modbus,
DUT-E COM (extended LLS)
- 485** – interface RS-485 Modbus,
DUT-E COM (extended LLS)

Symbols for special sensor modifications:

Ex – explosion protection

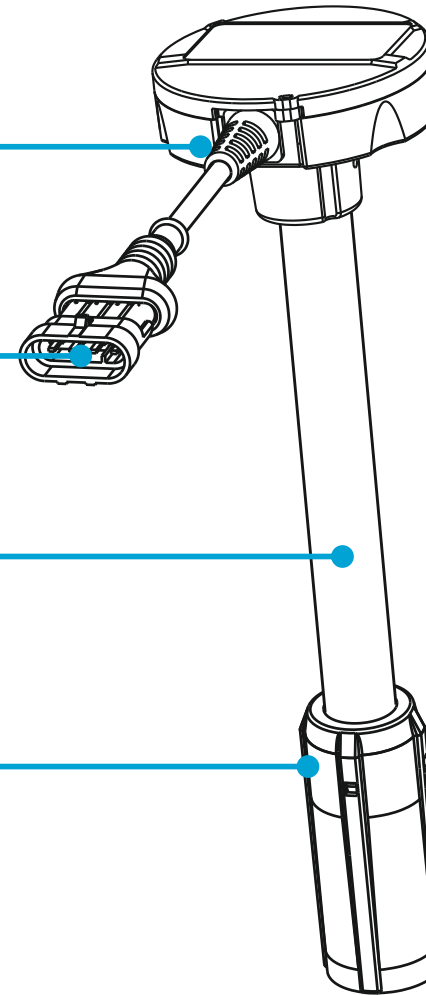
Design

Measuring "head" with
microcontroller inside

Interface cable

Measuring part (probe)

Bottom stop and screen filter



Watch video: "DUT-E fuel level sensor,
durability tests"

Design/ Measuring "head"

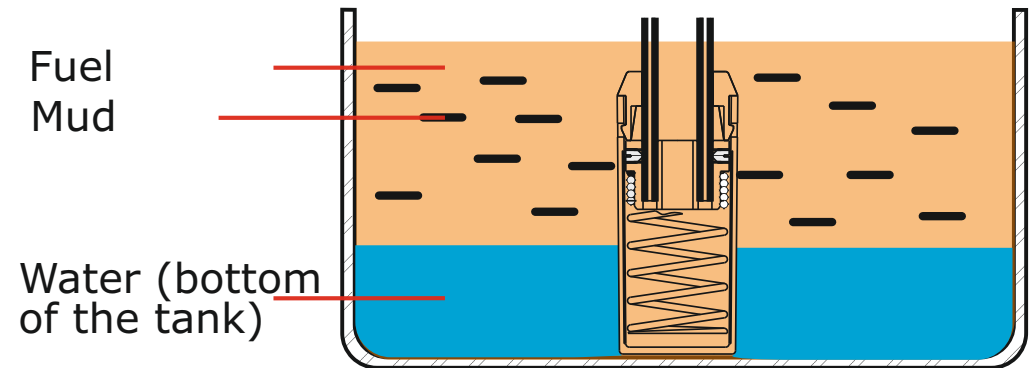


High-power STM microcontroller is used in DUT-E fuel level sensor for running in-built analytics (edge computing, IoT Burger technology).

DUT-E

Fuel level sensors

Design/ Bottom stop and screen filter



Bottom stop

increases durability of fastening,
sensor is mounted in tank firmly

Screen filter

protects against water and mud
gathering on fuel tank bottom –
purchased separately

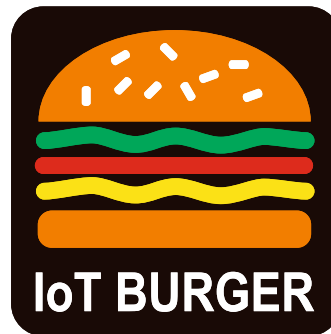


Watch video: "Screen filter
of DUT-E fuel level sensor"

DUT-E

Fuel level sensors

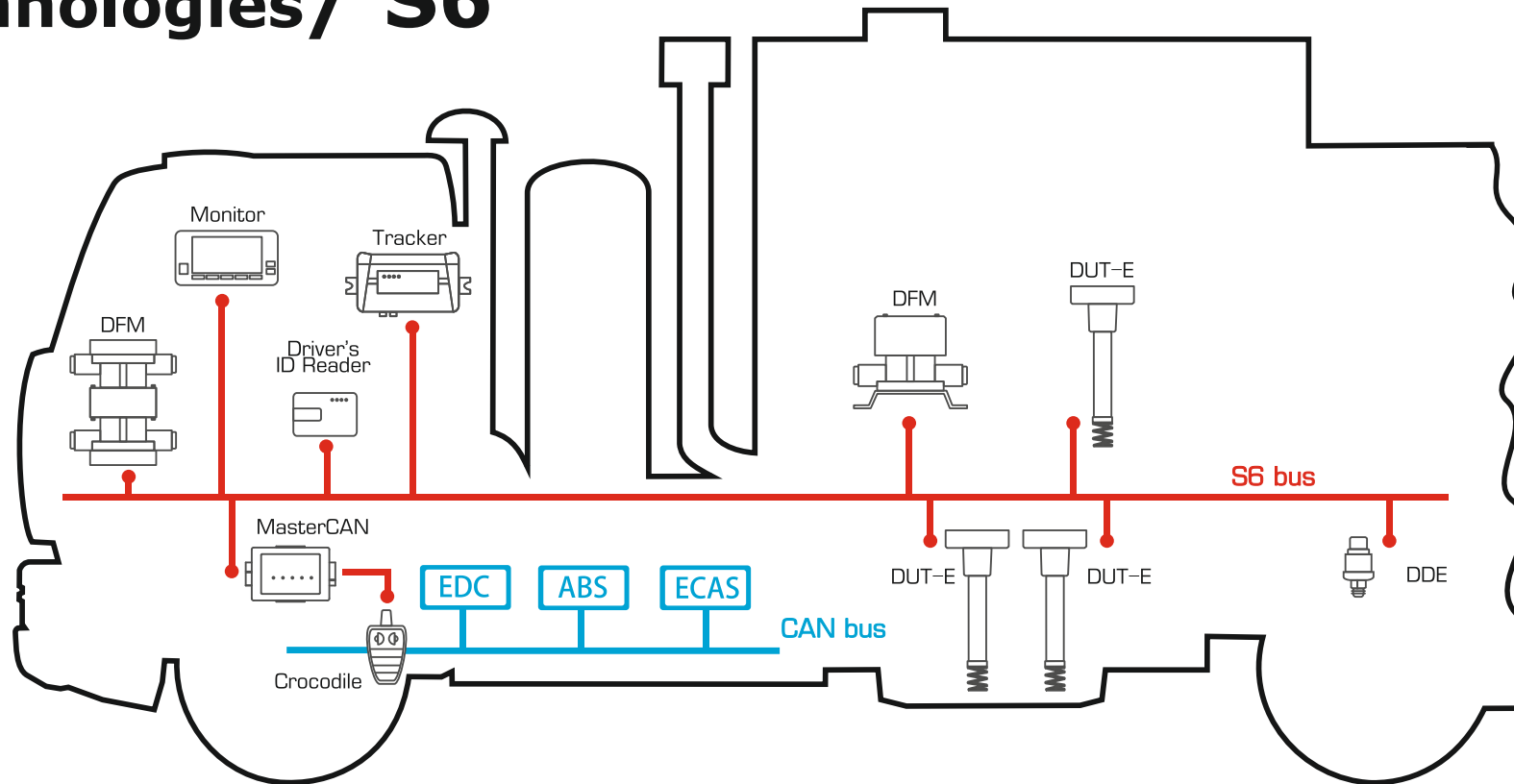
Technologies/ IoT BURGER



IoT Burger technology allows maximum data processing **“on board”**.
The technology allows DUT-E sensor to:

- detect “Fuel fill-up” and “Fuel drain” Events;
- carry out self-diagnostics, log data and Events to Journal in sensor’s memory;
- adjust signals (filtering, linearization, temperature correction);
- configure DUT-E over Bluetooth.

Technologies/ S6

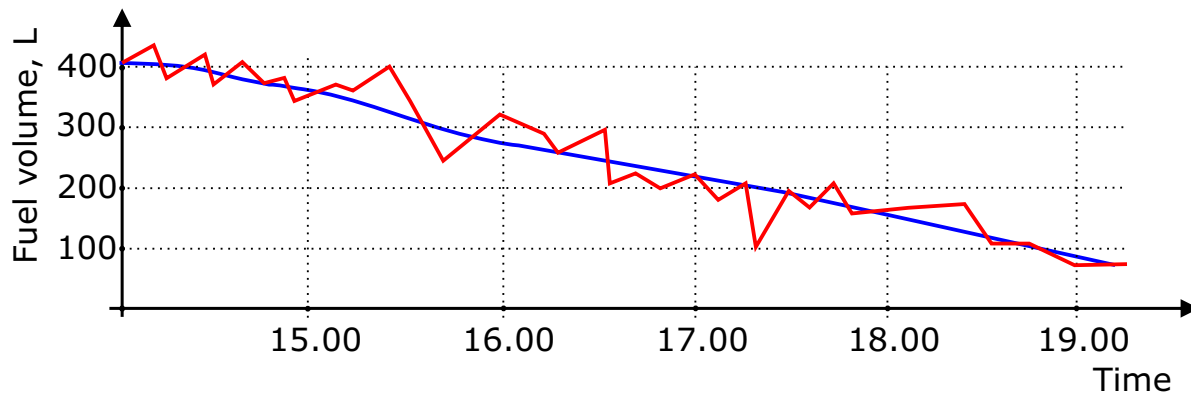


S6 Technology allows to build up telematics system for complex machinery (several fuel tanks, several engines or other fuel consumers, CANbus data integration).

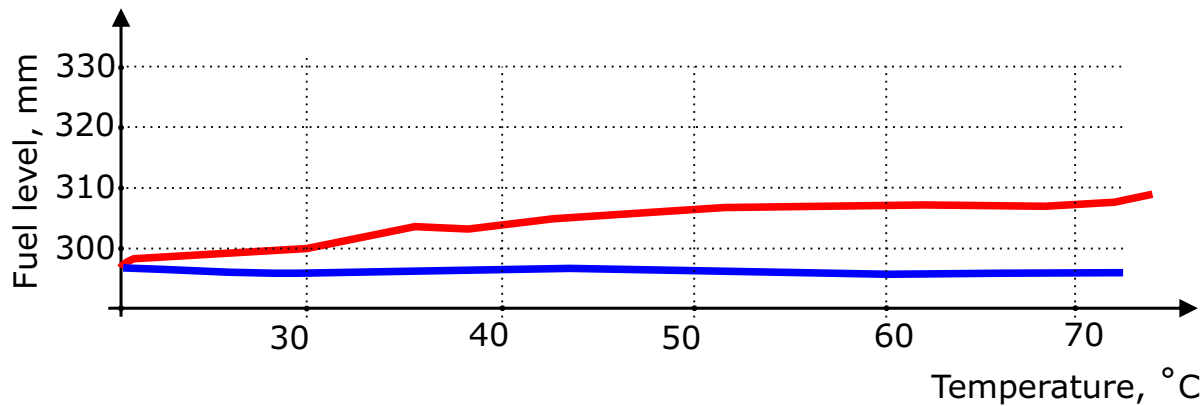


Fuel level sensors

Functionality/ Signal adjustment



**Signal filtration
(averaging function)**



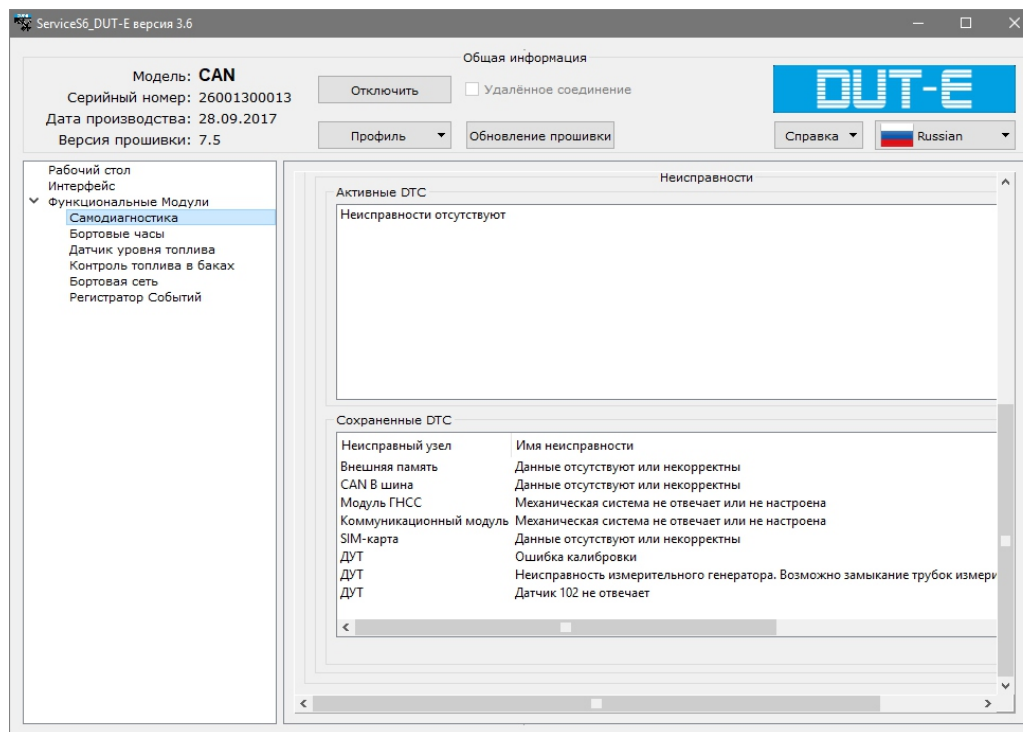
**Temperature
correction**

- Data from DUT-E
- Data from sensor without temperature correction



Fuel level sensors

Functionality/ Self-diagnostics and Journal



DUT-E checks the quality of data and its own operability. In case of malfunction detection, sensor will send malfunction code to telematics units. Also, the code will be saved in Journal in sensor's memory.

Interfaces/ Comparison of generations



Analog



Digital
RS-232/485



CAN j1939/S6

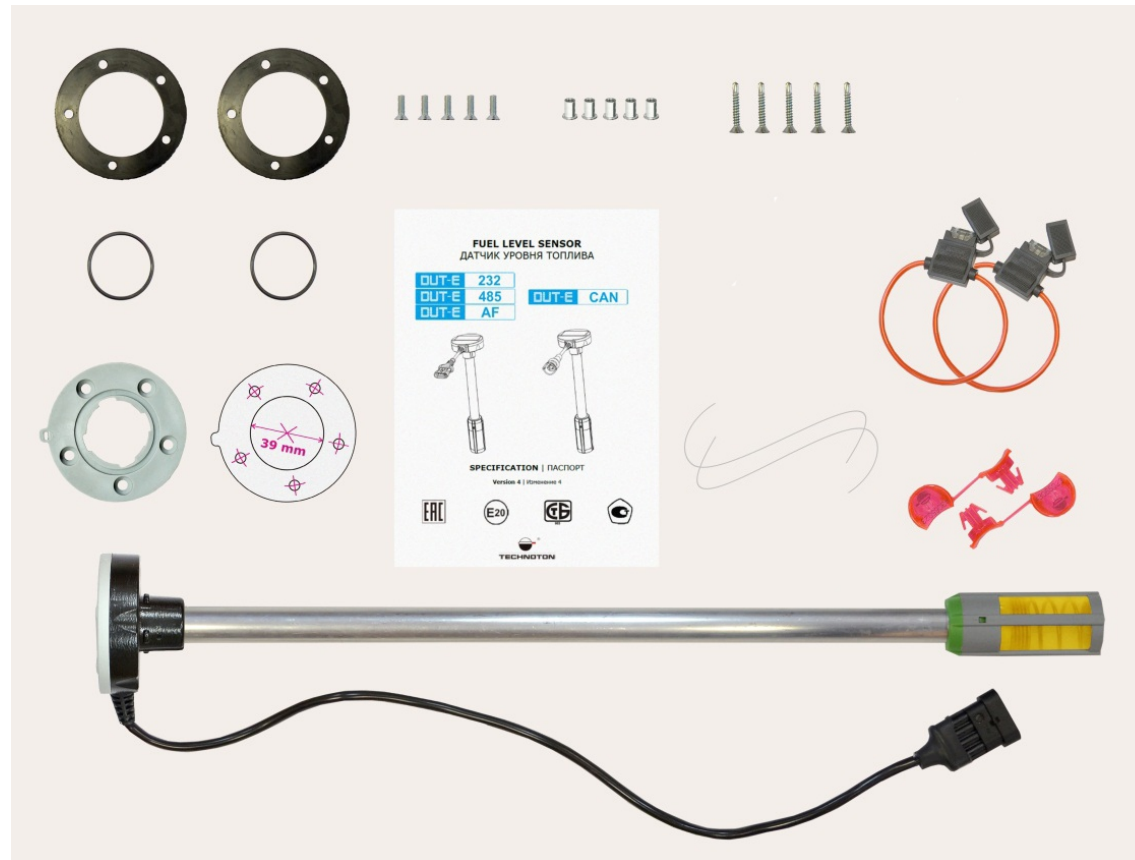
Interfaces/ CAN vs RS vs analog signal

Parameter	DUT-E AF	DUT-E 232	DUT-E 485	DUT-E CAN
Fuel level in tank, mm	Either volume or level	One of two can be selected		Yes, both
Fuel volume in tank, L				
Fuel volume in relation to total tank, %				
Total (sum) fuel volume in several tanks	8 tanks using summator	8 tanks using summator	–	Up to 8 tanks
Simultaneous monitoring of fuel volume in each fuel tank separately	–	–	Up to 4 tanks	Up to 8 tanks
Temperature	–	Yes		Yes
Sensor operability self-check	Yes	Yes		Yes
Sending data on fuel level to vehicle dashboard and LED-indicator of empty tank	–	–		Yes
Supply voltage (onboard network) monitoring	–	–		Yes
Current operation mode of onboard network	–	–		Yes
Operation time monitoring, split by different operation modes of onboard network	–	–		Yes
Event registration and logging (15 important and 15 informational) in nonvolatile memory	–	–		Yes



Fuel level sensors

Delivery set

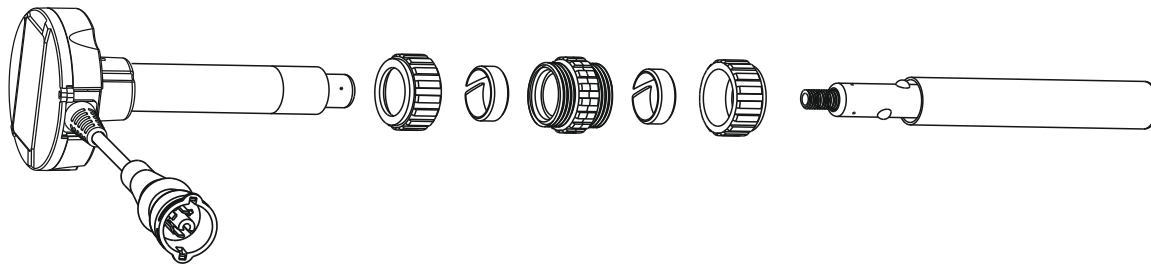


Delivery set includes all elements necessary for installation to fuel tank.
Screen filter – purchased separately.

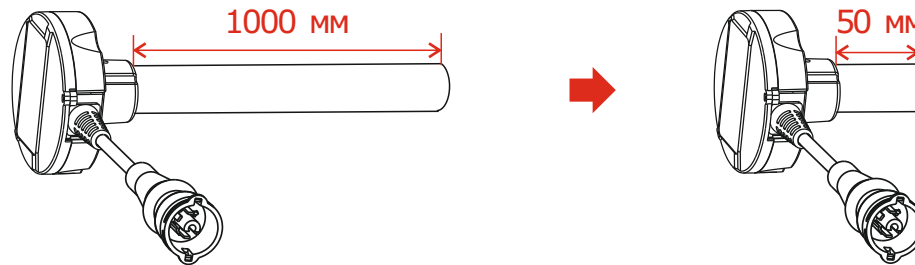
DUT-E

Fuel level sensors

Installation/ Shortening and extending length



Measuring part length is extended up to 6000mm by using additional sections

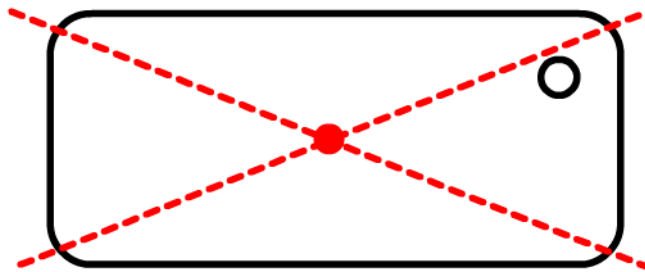


Measuring part can be shortened to any length by cutting probe.



Watch video: "Installing DUT-E 485 fuel level sensor"

Installation/ Choosing place in fuel tank



Installation to a geometrical center of the fuel tank is recommended.

Configuration/ Service software

For DUT-E configuration, download and install Service S6 DUT-E from our web-pages.

N°	Level, mm	Volume, L
1	0.0	0.0
2	63.9	10.0
3	130.4	20.0
4	215.0	30.0
5	300.0	40.0

Current Level: 0.6

Buttons: Add, Delete, Save to file, Read from file

Inspecting and changing current settings of sensor.

Carrying out sensor calibration.

Making up tank calibration table.

Saving sensor configuration profile to file on local drive.

Loading configuration profile to sensor from file on local drive.

Updating embedded software of sensor.

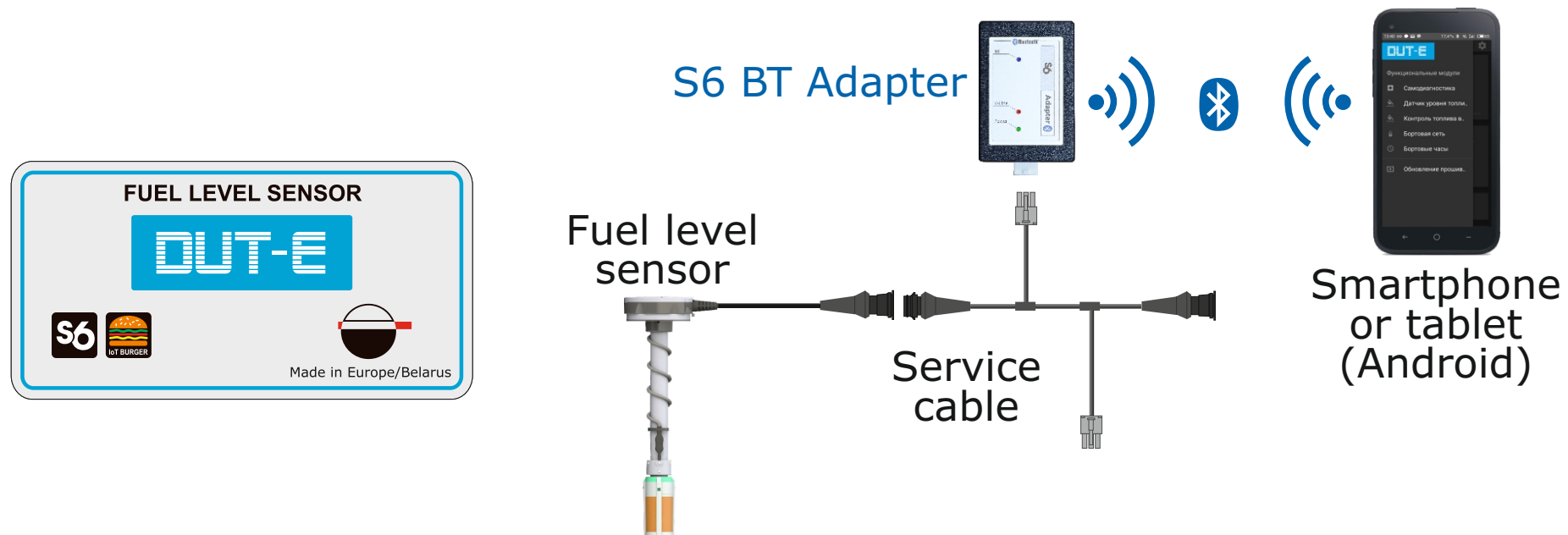
Checking sensor output data.


Running sensor diagnostics.

DUT-E

Fuel level sensors

Configuration/ Over Bluetooth



DUT-E fuel level sensors marked with IoT Burger Technology logo  can be configured over Bluetooth using Android-smartphone or tablet. To do that, S6 BT Adapter should be connected to sensor.

Mobile application Service S6 DUT-E is free for download from Google Play.

DUT-E

Fuel level sensors

Business cases/ Road trucks



150 trucks in Mexico are equipped with DUT-E 232. Fuel theft was stopped, what resulted in 25% fuel expenses decrease.

DUT-E

Fuel level sensors

Business cases/ Light masts



**DUT-E 485
+
satellite
tracker**

Fuel tanks of 150 autonomous light masts were equipped with DUT-E 485. Light masts are used in quarries (in Australia) as main light sources. Result - fuel and maintenance expenses decreased by 20%.

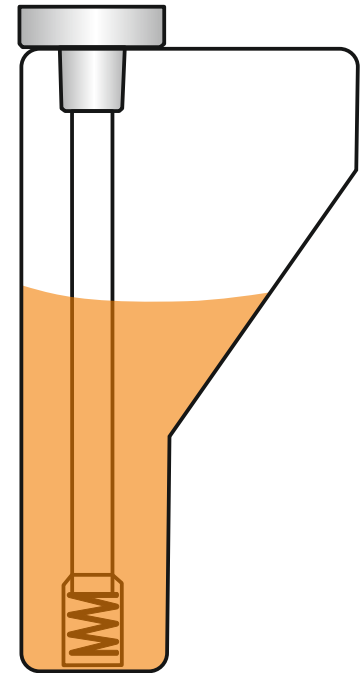
DUT-E

Fuel level sensors

Business cases/ Airport bus



DUT-E AF in complex-shaped fuel tank



DUT-E AF are installed in bus factory as a standard sensor for some models of buses. DUT-E has no moving parts - optimal solution for fuel tanks of unusual shapes.

DUT-E

Fuel level sensors

Business cases/ Construction machines



DUT-E are installed on 300+ of vehicles in PMK construction company.
Result - minimization of fuel thefts resulted in 15% fuel economy for tippers,
30-40% for special machines.

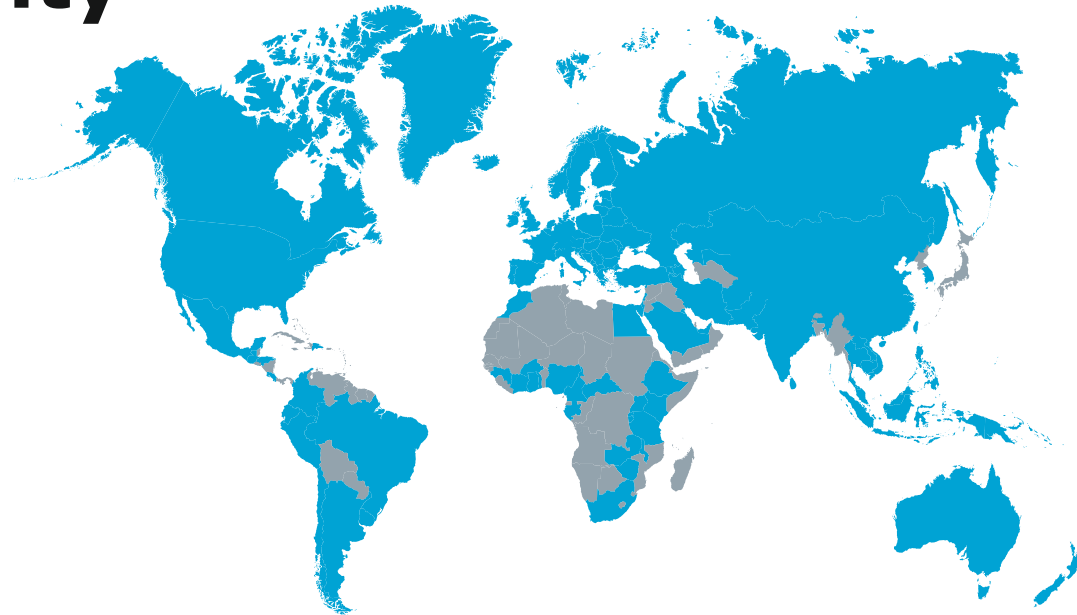
Summary

- ✓ Sends up to 25 parameters and Events: fuel level in mm, fuel volume in liters and % of total tank volume, temperature.
- ✓ Allows fuel monitoring in 8 fuel tanks simultaneously - total fuel volume and volume in each tank separately.
- ✓ Supports S6 Technology - can be used with other S6-compatible devices for building up telematics system for complex machinery. All devices are connected through S6 send data and get power supply over a single cable.
- ✓ Protected with screen filter from water and mud on the bottom of fuel tank. Bottom stop ensures rigidity of fixation inside fuel tank.
- ✓ Universal for any fuel tank - can be cut to any length or extended up to 6000mm. No movable parts - can be installed in complex-shaped fuel tanks.

DUT-E

Fuel level sensors

Popularity



140
countries

Countries, where DUT-E fuel level sensor are used



... and others

50+ manuals on connection and configuration to telematics units and GPS tracker of various manufacturers.



Fuel level sensors

Technoton

- ✓ **20 years** on telematics market.
- ✓ Full cycle - from design and prototyping to serial manufacture.
Certified according to ISO 9001.
- ✓ Technoton product are **installed** on **550 000** vehicles and stationary objects.
- ✓ Detailed product documentation, technical support and training in English and Spanish, installation supervision services.



Fuel level sensors

Learn more

[Official web-pages](#)



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