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A full-featured system of satellite monitoring and parameter control

The possibilities that the system provides

Vehicles and equipment are located in real time;



Fuel consumption is controlled (total fuel consumption during some time interval, average fuel consumption, drain, fueling).



CAN-bus parameters are controlled: the data is received from the electronic control units of a vehicle.



The function of vehicle units and assemblies is monitored and analyzed.



Subsystem for remote vehicle diagnostics: Geostron reads error messages DM1 received from the electronic control units of a vehicle.



System of graphic analysis displays the functioning of vehicle units and assemblies over time.



Parametric event system: the system informs you when a value of some parameter of a vehicle unit or assembly exceeds the maximum allowed value.

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System that evaluates the quality of vehicle operation and the driving style.

Flexible report system: you can generate reports on single vehicles and groups of vehicles (parking locations, calculated and actual parameter values).

Operations control center. You can call the driver right from the system applications via SIP-phone or have a teleconference.

Global coverage due to integration with space communication systems Iridium and ImmarSat: alarm events are received even from hard-to-reach regions.

Integration with ERP systems.

Monitored parameters

- Required torque;
- Actual torque;
- Engine speed, rpm;
- Engine oil level;
- Engine oil pressure;
- Coolant level;
- Position of gas pedal;
- Engine load in percent;
- Driving axle load;

- Coolant temperature;
- Fuel temperature;
- Engine oil temperature;
- Position of brake pedal;
- Total mileage;
- Total fuel consumption;
- Level of fuel in the tank;
- Error messages DM1
- The amount of controlled parameters depends on the type of vehicle units and assemblies.

System of driving quality evaluation

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Driving quality assessment settings



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, [Mileage	Max Speed	Violations	Points	Score
,	1254 km	96 km/h	78	1480	GOOD
,	8753 km	120 km/h	995	39430	BAD
	897 km	83 km/h	12	154	EXCELENT
	3680 km	91 km/h	114	2378	GOOD

Driving quality report

Economic indicators before and after the implementation of the system

Average fuel consumption before and after the implementation of the system



Economic effect and payback period for vehicle operation (70 vehicles)

Spent on co	ombustibles and lubricants	
in 2017:	\$ 2 579 486	
Spent on co	ombustibles and lubricants	
In 2018:	\$ 2 307 961	
Spent on co	ombustibles and lubricants	1 vear
In 2019:	\$ 2 286 682	
Creater and		
Spent on th	ne system installation	
and impler	nentation:	
	\$ 22 857	
Saved	\$ 269 947	
Javea.	Υ <u>203</u> 347	
	Payback period – 1 mont	h

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Predictive maintenance system

Predictive maintenance complex of the Geostron system provides a solution that helps to predict possible malfunctions timely. The system gets real-time data from the sensors installed in the vehicle units and assemblies, stores and analyzes the data.

Basing on the statistical data and on the information about vehicle operation modes used, Geostron makes a prognosis of how vehicle units and assemblies will function in the future. It allows to optimize maintenance activities, to improve quality of produced spare parts, to reduce spare parts inventory and to increase business profitability.



Reduction in repair costs up to 35% Optimization of spare parts turnover up to 47%

Reduction in maintenance costs up to 26%

26%

Increase in useful life of vehicles and vehicle units up to 33%

33%

Predictive maintenance system

Monitoring of the technical state of main vehicle units and assemblies is performed in real time. It allows to avoid unexpected expenses and increases the useful life of a vehicle.



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Predictive maintenance system



* Under development



System of fuel control for gas-engine vehicles

Controlled parameters



Average consumption of gaseous fuel



Total consumption of gaseous fuel for a chosen time interval



Remaining time of vehicle operation before the next technical inspection



Momentary discharge of gaseous fuel



Cumulative time of engine work when using gaseous fuel



Gaseous fuel volume in gas tanks



Absolute pressure of gaseous fuel in the system when feeding



Ambient temperature

Display of fueling and fuel consumption

A system report provides information about fueling locations, fueling volume and fueling time, and also shows the amount of fuel at the beginning and at the end of the chosen time interval, and average fuel consumption during this time interval.



Display of fueling and fuel consumption



Nº	fueling/drain	Date and time	Duration	volume (kg)	address
1	fueling	23.04.2019 8:58	5 min.	35	Starosarmanovska street, Zamelekesje
2	fueling	23.04.2019 16:59	6 min.	38	Vurmansk highway, Cheboksary
3	fueling	23.04.2019 21:24	5 min.	29	Northern highway, city district

	Time interval	23.04.2019	
	consumption (kg)	91	
	consumption (kg/100km)	9,1	
-	fueling (kg)	102	
	drain (kg)	0	
	mileage (km)	991	

Display of fueling and fuel consumption

	Diesel fuel consumption (l/100 km)	Gaseous fuel consumption (m3/100 km)	Average cost of diesel fuel (dollars for 1 litre)	Average cost of gaseous fuel (dollars for 1 m3)	Cost of 1 km in dollars
5490 hybrid	18,9	9,2	0,74	0,27	0,16
5490 diesel	30	0	0,74	0	0,22

Hybrid vehicle	0,16 dollars per 1 kilometre
Diesel	0.22 delleve nev 1 kileve etve
vehicle	0,22 dollars per 1 kilometre

Results of system implementation in a company

- Increase in effectiveness of transport operation and logistic operations;
- Reduction of losses caused by fuel theft, elimination of unauthorized trips, vehicle misuse and standing periods;
- Control of fueling volume at gas-filling stations;
- Reduction of maintenance costs, increase in useful life of vehicles;
- Increase in safety of vehicles, drivers and cargo;
- Statistics, reports and effective planning for managers at all levels.

