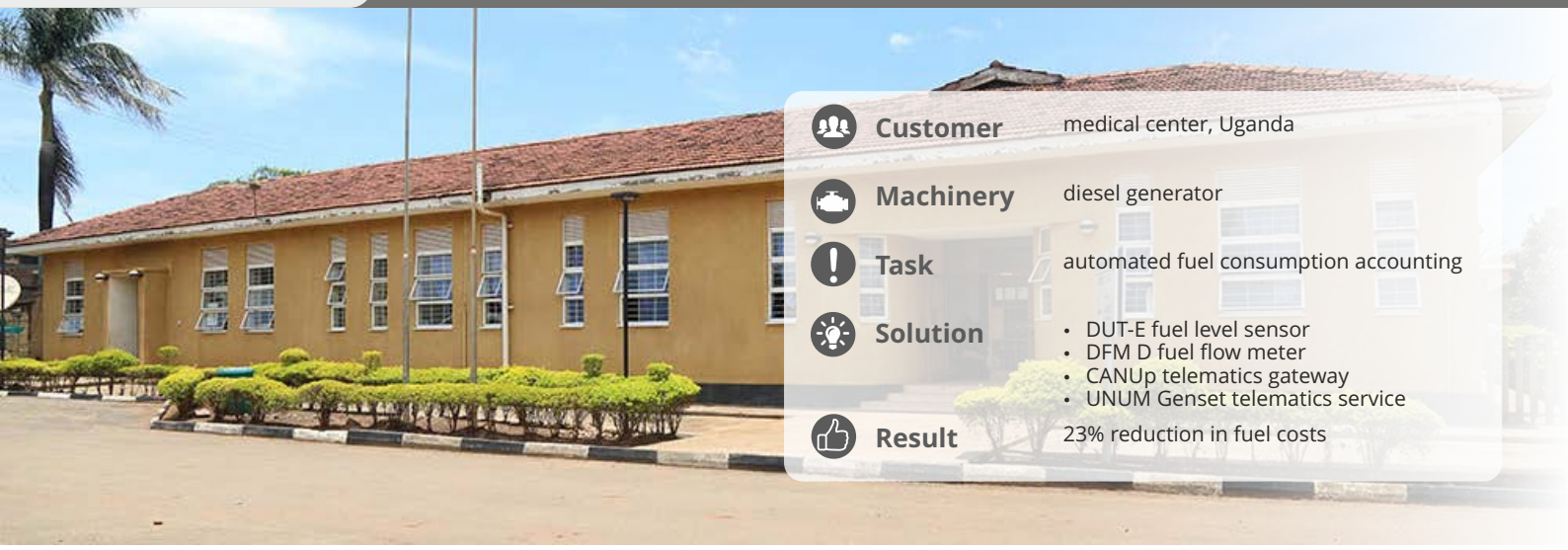
Fuel monitoring – diesel generator



Customer	medical center, Uganda
Machinery	diesel generator
Task	automated fuel consumption accounting
Solution	• DUT-E fuel level sensor • DFM D fuel flow meter • CANUp telematics gateway • UNUM Genset telematics service
Result	23% reduction in fuel costs

CUSTOMER

The medical center is located in Mbale, a major city in Uganda. Its service area covers approximately 10% of the country's population.

Medical center includes diagnostic, surgical, pediatric, and gynecology departments.

359 employees

450 inpatient beds

4.6 million people in the service area

MACHINERY

CAT D100 GC C4.4 diesel generator

For backup power supply, the hospital uses CAT D100 GC C4.4 diesel generators. The generator provides a maximum standby power output of 100 kVA.

The generator is powered by a Cat C4.4 engine, an inline 4-cylinder engine with a 4.4-liter displacement.

The generator is equipped with a DSE 7320 MKII controller. In the event of a grid failure, the controller automatically starts the generator and transfers the load to it. Once grid power is restored, the controller switches the load back to the main supply and shuts down the engine.

TASK

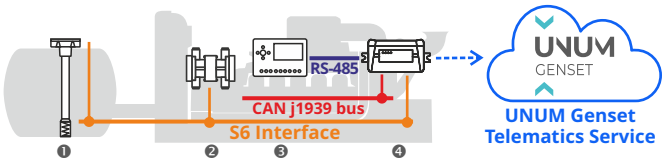
Fuel accounting is based on standard operating hours, without direct measurement of actual fuel consumption or the remaining fuel level in the tank. This approach creates conditions for misuse and potential abuse, raising suspicions of fuel theft.

The primary objective is direct measurement of real fuel consumption and fuel level in the tank, with data transmitted to the telematics service in real time. This enables remote fuel monitoring without the need for on-site presence.

An additional objective is to transmit alternator and engine operating data from the generator controller to the telematics service.

DSE 7320 MKII controller installed on the generator

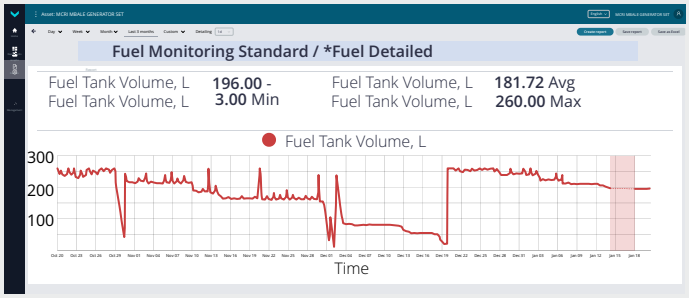
SOLUTION



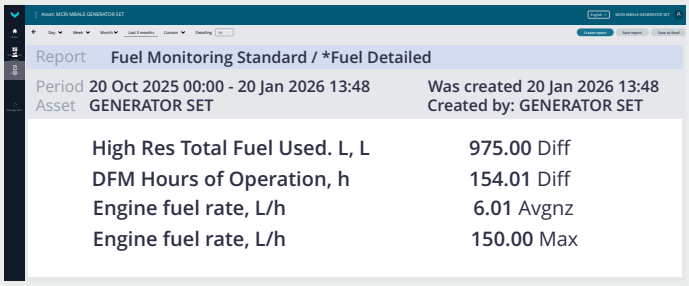
Monitoring system components: ❶ DUT-E fuel level sensors in the tank; ❷ DFM D fuel flow meter in the fuel line; ❸ DSE controller; ❹ CANUp Genset telematics gateway.

DFM D fuel flow meter installed in the fuel line

CANUp Genset telematics gateway



UNUM Genset report (3 months) – fuel volume



UNUM Genset report (3 months) – fuel consumption

DFM 250D CAN fuel flow meter directly measures fuel consumption and maintains counters for total fuel used and engine operating hours. DUT-E CAN fuel level sensor monitors the remaining fuel in the tank and detects refueling and fuel draining events.
CANUp Genset telematics gateway receives fuel sensor data via the J1939 / S6 interface and data from the DSE controller via Modbus RTU.

CANUp Genset collects operating parameters of the alternator (voltage, frequency, current, power factor) and the engine (RPM, temperature, and technical fluid pressure).

The data is transmitted to the UNUM Genset service, where the customer monitors operating parameters in real time and uses analytical reports to plan fuel expenses.

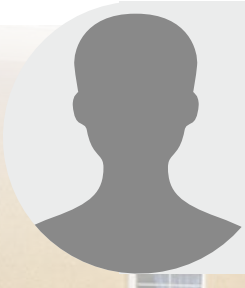
Ilya Salanets, account manager, Technoton

"Initially, the client needed real-time visibility of fuel consumption and fuel level directly on the generator controller. This was achieved by installing high-precision fuel level sensors and a fuel flow meter, with data transmitted to the controller via the J1939 CAN bus.
Over time, the customer needed to eliminate on-site data monitoring to save time and reduce staff workload. We proposed installing a telematics gateway and connecting the system to UNUM Genset, which elevated the monitoring system to a new level by enabling remote access, clear data visualization, and advanced analytics."

RESULT

Online monitoring of fuel consumption and remaining fuel levels has provided full fuel transparency in generator operation. The system records all refueling and fuel draining events and automatically notifies responsible staff, eliminating unauthorized fuel withdrawals. Fuel no longer "disappears" from the tank.

Fuel is now purchased and written off based on actual consumption, rather than averaged operating-hour norms. **Generator actual use was 2.5× lower than the estimate. Overall fuel costs across all generators were reduced by 23%.** Customer plans to deploy the fuel monitoring system on the remaining generators.



Technical Specialist of a Technoton Partner Company in Uganda*

"Two reasons for choosing the Technoton solution.

- ***Market reputation and trust.*** *Technoton is well known in the African market as a manufacturer of reliable equipment designed to withstand harsh climatic conditions and high operational loads. The company is valued for its measurement accuracy and long service life.*
- ***End-to-end turnkey solution.*** *Technoton provided a complete generator solution: fuel monitoring, controller integration, and a telematics service. The equipment is compatible with controllers from leading manufacturers, including DSE. The customer receives a single integrated ecosystem instead of a set of disconnected components."*

** Details are withheld to comply with GDPR requirements. Additional information may be disclosed upon signing an NDA and with partner's consent.*