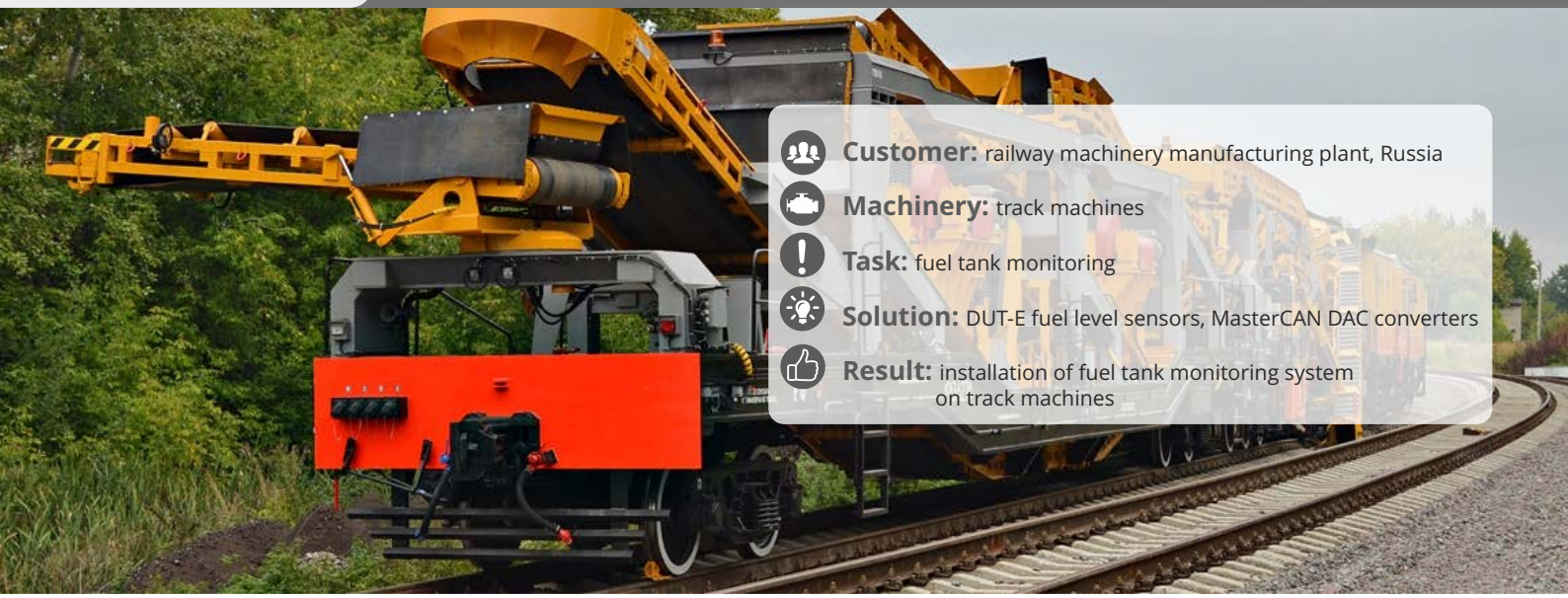
Track machines, Russia



Customer: railway machinery manufacturing plant, Russia

Machinery: track machines

Task: fuel tank monitoring

Solution: DUT-E fuel level sensors, MasterCAN DAC converters

Result: installation of fuel tank monitoring system on track machines

CUSTOMER

The plant is one of the oldest machine-building enterprises in Russia. Main line is manufacturing of heavy track machinery and equipment for construction, renovation and maintenance of railway tracks. Equipment designed by company run on the railways of Russia and CIS countries.

700+ employees

152 years of successful work

2500+ track machines produced

MACHINERY

Three types of track machines were chosen for installation of fuel tank monitoring system.

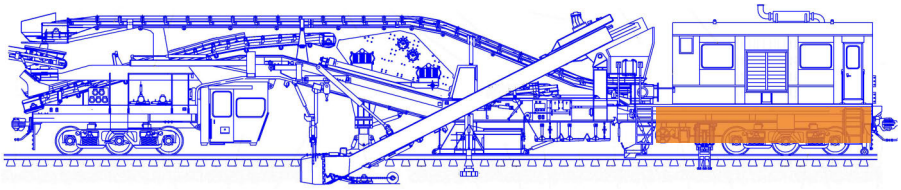
Track alignment, ballast section compacting and equalising machine
Two fuel tanks of 1200 L

Ballast Cleaning Machine
Two fuel tanks of 3200 L and one fuel tank of 1300 L

Snow Blowing Machine
Two fuel tanks of 1200 L

TASK

All track machines are equipped with several large-capacity fuel tanks - from 2400 to 7700 liters, depending on type of machine. Fuel tanks are of squared shape, low and elongated.



Fuel tanks on track machines are low and elongated (highlighted in orange)

Basic solution for railway machinery is fuel monitoring, based on standard float sensor and transmitting of analog signal to fuel indicator on dashboard. **However, float sensor measures fuel level with inaccuracy of a few centimeters. That means, indicator on dashboard do not display even draining of 200 - 300 l liters from fuel tank.**

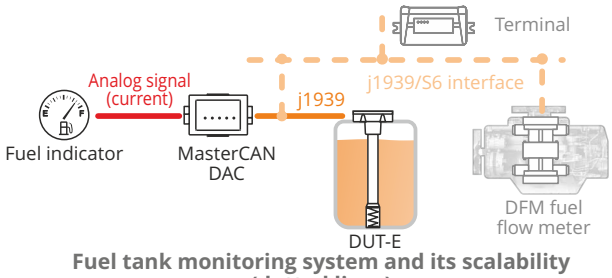
Our customer wanted fuel level sensors with high measurement accuracy. Fuel level in tank had to be measured with inaccuracy not more than ± 1%. Data on fuel volume had to be displayed on dashboard of track machine in the form of analog signal (current). In the long run, the system should be scalable with an option of connecting fuel flow meters – to measure current and travel consumption, and telematics unit – for online transmission of fuel data and parameters of machine operation to telematics service.

SOLUTION

In order to find an optimal solution to solve the task, the customer turned to Technoton-MSK company (Technoton's distributor). Technoton-MSK proposed fuel tank monitoring system based on DUT-E fuel level sensor, MasterCAN DAC 15 J1939 i/o module and S6 cabling system.

DUT-E fuel level sensor and MasterCAN DAC J1939 i/o module

DUT-E fuel sensor with CAN interface measures fuel volume in fuel tank with high accuracy - measurement interval is 0,1 mm. Device converts fuel level value (mm) into volume (l). Calibration table is stored in the sensor's memory. Digital data (SPN) on fuel volume is transmitted via j1939 protocol to the input of MasterCAN DAC 15 J1939 i/o module.



Fuel tank monitoring system and its scalability (dotted lines)

MasterCAN DAC 15 J1939 i/o module is an intelligent converter of digital and analog signals. MasterCAN DAC 15 converts digital data on fuel volume into a current signal with a value of 4 to 20 mA, which is transmitted to dashboard of track machine and displayed on fuel indicator.

Elements of S6 cabling system provide safe and reliable connection of DUT-E and MasterCAN DAC 15 to dashboard. Data is transmitted according to CAN j1939 standard. Functionality of fuel tank monitoring system can be quickly expanded upon customer's requests thanks to easy scaling of the system. At any moment additional connection of DFM fuel flow meters, telematics unit, CAN display and other devices could be made.

Vadim Shadursky, Head of Sales Department, Technoton-MSK

"Our customer had a necessity of displaying fuel level in tanks of track machines on dashboard with measurement inaccuracy not more than 1%. We offered telematics system, based on DUT-E fuel level sensor and MasterCAN DAC converter, connected via S6 Technology. The solution has proven to be optimal at price, easy to install and configure. Fuel tank monitoring system is easily scalable, so, in the long run, it is possible to connect telematics unit and DFM fuel flow meters with CAN interface. "

RESULT

Fuel tank monitoring system, which consists of fuel level sensor, converter and cabling system by Technoton, has completely solved customer's task of monitoring fuel volume in fuel tanks of track machines. **DUT-E fuel level sensors and MasterCAN DAC converters are incorporated into design documentation on track machines.**

Now the company is going to install fuel tank monitoring system by Technoton on all track machines manufactured. Fuel level measurement system is quickly mounted, connected to onboard network of machine without using additional power sources. All elements of telematics system are easily configured from one point.

Leading specialist of customer company *

"In 2014, our company held a tender to select the best installer of fuel monitoring system for track machines. As a result, we signed a contract with Technoton-MSK for supply of Technoton sensors and converters. At the beginning of 2021, devices by Technoton were installed on more than 300 machines. Monitoring equipment had put its best foot forward, there had not been a single case of rejects. We recommend Technoton-MSK as a reliable supplier of high-quality Technoton products. "

** Data is hidden from public access. Details on the project can be disclosed upon signing NDA and with the consent of «Technoton-MSK».*