



-  **Partner:** telematics system provider, Sweden
-  **Machinery:** city and intercity buses
-  **Task:** fuel consumption monitoring of buses
-  **Solution:** Technoton CAN tools
-  **Result:** implementation of driving quality system

## PARTNER

Technoton's corporate business partner – is one of the largest telematics system providers in Northern Europe. Offices of the company are located in Sweden, Norway, Finland, Estonia, Latvia and Lithuania.

The main sphere of the company's activity – solutions for road and rail transport monitoring, as well as for automation of industrial facilities. In 2019-20, the company has introduced Eco Driving quality system for buses, the first customer was one of major bus fleets in Sweden.

## MACHINERY



Vehicle fleet includes VDL Buses and Volvo buses, **over 700 buses** for city and intercity transportation in total.

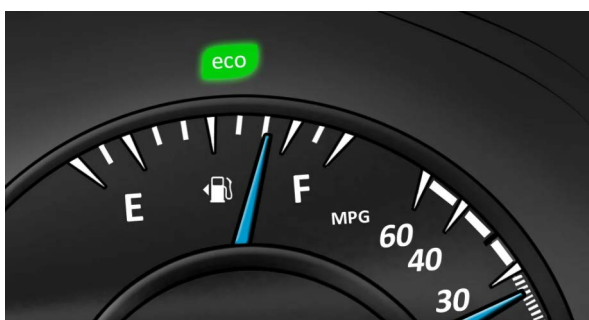
·Seating capacity of VDL Citea city bus is no less than 100 passengers. Bus is equipped with a 6,7 liters Cummins turbodiesel with capacity of 187 KW.

·VDL Futura intercity bus is fitted with 45 - 60 seats. DAF turbo diesel is 10,8 liters in a volume and has capacity of 300 KW.

·Volvo 9500 intercity is fitted with 45 - 60 seats. Volvo diesel engine is 7,7 liters in a volume and has capacity of 245 KW.

Standard fuel consumption of buses is from 25 to 30 liters per 100 km.

## TASK



Our partner had to implement telematics system in bus fleet to execute Eco Driving quality system. That required:

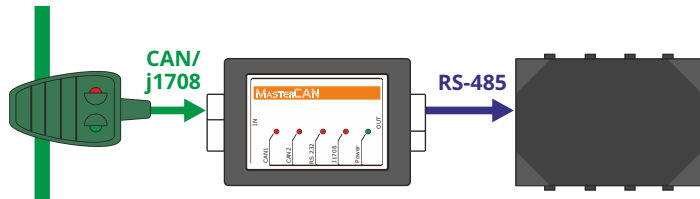
- monitoring location and route of buses;
- data on the speed, acceleration/deceleration of the bus;
- data from the tachograph in real time;
- control of physical condition of drivers with a breathalyzer;
- diesel fuel consumption monitoring.

Data from tachograph is transferred to telematics unit via RS-232 input. Tracker uses GPS to determine location of the bus, its speed and acceleration.

Data on instant fuel consumption is available in CAN/j1708 bus, it's not possible to gather it from standard OBD II connector. Direct connection to information bus of vehicle is required to read and transmit data on fuel consumption.

After connecting tachograph, only RS-485 (ASCII protocol) digital input of telematics unit remains free. Thus, **to provide transferring of fuel data to telematics system, a special device, that allows converting CAN/j1708 bus messages to ASCII text format (understandable by a telematics unit), should be installed.**

## SOLUTION



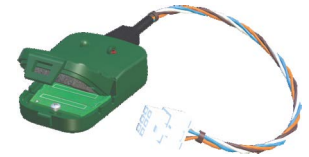
Scheme of converting data from the standard CAN/j1708 bus to RS-485 data for tracker

MASTERCAN

ROCODILE



Data converter



Contactless reader

Telematics systems have been installed on over 700 buses. **To receive and convert data from CAN and j1708 information buses, CANCrocodile and 1708Crocodile contactless readers and MasterCAN C232/485 and MasterCAN V-Gate data converters were chosen.**

In Volvo buses, on-board information is transmitted via j1708 bus. 1708Crocodile contactless reader has been installed on 1708 bus to read it. Data gathered by the device is sent to the input of MasterCAN converter, which converts it to RS-485 data (ASCII text protocol). After that, data is transmitted to corresponding input of telematics unit.

In VDL buses, information is transmitted via CAN j1939 bus. Conversion scheme here is similar as described above. To provide data reading and converting CANCrocodile contactless reader and MasterCAN C232/485 data converters are used.

MasterCAN data converter receives data on instant fuel consumption from information bus of vehicle and calculates total fuel consumption from the time of engine start.

Crocodile contactless readers are installed on wires of information bus without electrical connection and damaging CAN wires. Devices safely read data without any impact on automotive electronics. Converters and readers are supplied from a bus power supply - no additional power source is required. This speeds up and simplifies installation of the devices.

### Veronika Reut, Wagencontrol – Technoton representative in the European Union

*“Technoton is going towards our client. We make devices not only in the standard version, but also release customized products for specific projects. In the present case, **Technoton has manufactured a batch of data converters of a special configuration.** We have changed standard cables to cables with a mount hole to be connected to standard CAN sockets. Through the development of a new product – it has become easier to provide fuel consumption monitoring: we have installed only converters on the buses, we did without contactless readers.”*



## RESULT

After installation of telematics system was completed, bus fleet has received all the necessary information that allows implementing of Eco Driving system. **Thanks to MasterCAN data converters it was made possible to connect easily to CAN j1939 and j1708 information buses and gather data on fuel consumption.** Data on location, speed and acceleration of buses, speed and other parameters of engines, as well as data on fuel consumption - is sent to telematics service.

In addition to data on instant fuel consumption, data converter sums fuel consumption during the trip and transmits this data to tracker. Based on this information, management of bus fleet have developed requirements for quality of driving. The result of meeting these requirements is an increase in transport safety, fuel economy, and also a careful attitude of drivers towards buses, which leads to repair costs reduction.

### Technical specialist of partner company \*

*“We have installed Technoton data converters and contactless readers to convert fuel data from information buses of vehicles. To install Technoton devices, we did not need to change electrical circuit of the bus. We had to configure only one converter and, after that, a file with setting profile was exported and written into memory of all other devices. So, configuration of hardware didn't take long.”*

*\*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.*

