

J1939 AND CANopen

Diagnostic system for heavy-duty and off-road vehicles

The Telematics Gateway from iWave is a vehicle diagnostics system that monitors key parameters of a vehicle from anywhere. It is built with four CAN interfaces and is suitable for heavy-duty trucks, off-road vehicles, emergency vehicles, and vessels.



Heavy-duty and off-road vehicles (Source: iWave)

Parameters such as location, working duration, engine performance, engine parameters need to be continuously monitored to prevent failures of vehicles and extend the life of these. The gateway also encompasses sensors that can enable applications such as e-call, driver behavior analysis, idling time, and other key features that can enhance the personalization experience, said the company. With the support for multiple protocols and edge firmware, the gateway is suitable for applications ranging from heavy duty trucks, vessels, industrial machinery, and passenger cars. The used protocol stacks support ISO 15765-4 CAN, J1939, ISO 11898, CANopen, as well as CiA 447. The product acts as one multi-purpose device catering to various vehicles and mobility infrastructure.

With off-road vehicles such as forklifts, cranes often leased out by manufacturers and often used for long hours in extreme working conditions, it is important for the owners to monitor their location and the parameters to control the usage. Heavy-duty and off-road vehicles are used in large industrial spaces such as power plants, manufacturing units, construction sites with rough environmental, and operating conditions, which makes them vulnerable to sudden failures and frequent breakdowns.

The introduced gateway caters to such rugged applications with a range of input interfaces including four CAN (FD), [LIN](#), EIA-232, EIA-485, and others. Integrated with a cellular 4G modem and various other wireless connectivity options such as Wi-Fi and

Bluetooth, the telematics gateway enables data transfer from the vehicles to the cloud platforms. Through Bluetooth, users can also configure the gateway as an electronic logging device and connect to the driver's phone to monitor the driving time and safety.

The data collected through CAN, sensors, and other data parameters can be collected on the gateway and parsed onto an IoT (Internet of Things) cloud platform for further data analytics and modeling. Integrated with a NXP i.MX 8 application processor with an internal memory of 8 GiB, the gateway also provisions for data storage in regions of no connectivity.

The gateway is integrated with the J1939 protocol for compatibility with heavy-duty vehicles and commercial trucks. J1939 was standardized by the SAE, creating a uniform language on the CAN network across the industry. This standard includes the digital annex (DA) which defines thousands of signals that could be used on CAN, a subset of which are for EV-specific signals (such as high voltage, battery state of charge, vehicle charging status, and more).

The protocol support allows the product to retrieve diagnostics information and real-time data from the vehicle's interconnected ECU (electronic control unit) system offering the following key advantages: access to diagnostics data for detection and troubleshooting of failures, remotely access and critical statuses of machines, ensure vehicle uptime with preventive /predictive maintenance, notify negligent use, damage, and attempt of theft.

Manufacturers and asset owners have a need to remotely monitor their assets on the field while gaining valuable insights from the cloud platform to determine the occurrence of any failure and take preventive actions to reduce the time of such assets. This can help manufacturers schedule preventive maintenance visits, acquire spare parts and other inventory, and allocate the right technician for service. The Telematics Gateway is designed to operate in harsh environments and conditions like vibrations, extreme temperatures, and wet or dusty conditions.



The operating temperature is -20 °C to +70 °C (Source: iWave)

[CW](#)