

Calibrating Emissions Dynamometer Equipment

Influx Rebel XT Vehicle Data Logger

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CAS DataLoggers recently provided the data logging solution for a large and well-known original equipment manufacturer using a standard production diesel vehicle to calibrate the emissions dynamometer equipment at their plant. The test vehicle was locked in place with its wheels parked on pairs of large metal rollers. Using weights along with electronic coordination, these rollers matched the test car's inertia and driving resistance. The vehicle was driven over a preset speed profile to make so its engine would experience typical road conditions and achieve a given speed and/or acceleration. An emissions analyzer was connected to the vehicle's exhaust, which recorded the amounts of each pollutant (HC, CO, NOx, CO₂) emitted by the test vehicle. Every day this vehicle would be driven through the same test drive cycle under these easily repeatable conditions, and the diagnostic results would indicate if the emissions equipment was suitably calibrated. During these test cycles, the engine was started and driven at many different speeds for about 7-11 miles (10-15 km). However, during certain tests, the vehicle would unexpectedly regenerate its emissions reduction system, potentially causing major damage by overheating the emissions analyser that was connected to the exhaust. The customer needed a way to help prevent this by warning when the regeneration process would take place so that the vehicle could be taken off-line or the emissions analyser could be disconnected.



The manufacturer installed an **Influx Rebel xt Vehicle Data Logger** onto the vehicle diagnostic bus of the test car. The Rebel allowed plant engineers to directly access the engine parameter data and to record all the test data. The Rebel xt is a high-speed vehicle data logger designed for vehicle test and OEM engineering data acquisition. It supports CAN and high-speed CCP and xCP protocols to acquire internal ECU parameters. CAN signals could be recorded in a 'listen only' mode for CAN bus data logging applications. Data collected during each test was automatically uploaded via an optional integrated GPRS cellular modem with EDGE technology to a central server so that the lead engineer could monitor key parameters from his desk daily. From this data the engineer was able to prevent the regeneration occurring during testing, saving the plant's emissions analyser from potential damage. In addition, the data logger indicated to the driver via a LED if a regeneration process was due.

The Rebel xt offered flexible and powerful data logging and was able to collect a wide range of signals including OBD, CAN, analog and GPS. It could also capture other real-time data from several sources including temperatures, RPM, brake and throttle settings, latitude, longitude, speed, etc. for extended periods without requiring any user interaction. A flexible, affordable communications interface was featured for in-vehicle electronic modules; using multiple high-speed microprocessors, they could simultaneously capture data from 3 different CAN sources with additional sensor options available. The plant engineer found the Rebel xt easy to setup with no need to write any complex scripts. Using the 3 opto-isolated CAN communications channels, the Rebel xt allowed data to be collected from the OBD

port using ISO14229 and ISO15765 protocols. It also features support for K-line and LIN 1.2 protocols allowing data collection from many different types of vehicles. Safely contained in a rugged dust- and splashproof enclosure, the Rebel xt data logger also featured an LCD Display, keypad and 8 LED's, internal and external SD memory storage of 2GB each, and multiple trigger sources. Powerful communications technologies included Bluetooth wireless for local data monitoring and upload.

The plant engineer in charge of the test project found the Rebel xt a useful tool, as the data logger acquired most of the additional data itself without the need for additional instrumentation. The Rebel xt vehicle data logger gave the added benefit of recording each drive cycle so that the emissions results could be closely analyzed for any abnormalities.

Additionally, the Rebel xt datalogger included free DiaLog software for configuring the data acquisition and analyzing data in one intuitive package. DiaLog offered configuration via Bluetooth or USB and imported industry standard ASAM A2L files, ODX and CAN dbc formats. The plant engineer constructed complex data logging configurations using the simple graphical interface, which also allowed retrieval of test data by direct and remote connections. The vehicle data logger could also be configured to acquire, store and export files for distribution. DiaLog also enabled in-field firmware upgrades and featured DataVue, an integrated professional data analysis tool allowing for advanced visual data analysis with the use of sophisticated graphing tools; DataVue allowed data export in standard formats including MDF, Matlab, and CSV.

The customer gained multiple benefits from installing the Influx Rebel xt Vehicle Data Logger to calibrate their emissions equipment, foremost of which was the ability to prevent the test vehicle regenerating in the middle of the project and damaging the heat-sensitive equipment. This alone saved the plant a good deal of time and money. Direct access to test data and automatic uploads via GPRS modem enabled constant project supervision. The Rebel xt CAN-based vehicle logger also provided the plant with a cost-effective means of recording the data without requiring extra instrumentation and could capture a wide variety of other real-time data, ensuring its use in subsequent vehicle tests applications. Easy configuration and intensive analysis was provided via DiaLog software, increasing data accessibility using standard formats. Add-on optional functions for the Rebel xt included an integrated GPS module for location tracking, and an additional mini SD card. An instrumentation module and extension box was also made available, providing electrically isolated analog instrumentation and temperature measurement via K-type thermocouple inputs. The project engineer could also utilize complex triggering capability, enabling up to 30 conditions and triggers, multiple logic commands and an external manual trigger option.

For further information on the Influx Rebel xt vehicle data logger, other data logging devices, or to find the ideal solution for your application-specific needs, contact a CAS Data Logger Applications Analyst at (800) 956-4437 or visit the website at www.DataLoggerInc.com.

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