

Testing Fuel Consumption in a Gold Mine

Using the dataTaker DT80 Intelligent Universal Input Data Logger

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CAS DataLoggers recently provided the datalogging solution for **FPC International**, a company specializing in a fuel additive widely used in tankers, trucks, and trains all over the world to save on fuel and engine maintenance costs while reducing carbon footprints and emissions. Rather than just making claims of their product's benefits, FPC Intl. actively tested and documented its results, making all of their testing available online for customer review. The company's current project was located in a productive gold mine in Sonora, Mexico. The mine's owners used 60 rock trucks with Caterpillar 789C diesel engines to haul the gold ore out, and FPC arranged a demonstration including a series of fuel tests to show the owners the benefits of switching from the additive they were currently using. FPC engineers therefore had a need for a powerful yet cost-effective datalogging solution with the flexibility needed to measure the engines' horsepower output and fuel consumption of the rock trucks during brake-specific fuel consumption testing. This intelligent solution would also need to support versatile communications options, particularly USB data transfer for convenient onsite demonstration to the customer.



FPC International installed a **dataTaker DT80 Intelligent Universal Data Logger** in a ruggedized Pelican case in the rock truck under test, inside the cabin right behind the driver's seat. The logger was powered from the cigarette lighter socket, and the company also installed an inverter which was also plugged into the cabin. The DT80 datalogger was then connected to sensors acquiring the necessary data, including 2 flow meters measuring pulse signals. During the brake-specific fuel consumption test, the flow rate sensors counted pulses and their frequencies from the Cat diesel engine, while RTD sensors were used to measure engine temperature. To measure horsepower, they connected the datalogger to a tachometer measuring the RPM of the motor.

Using these parameters, the test project first measured the efficiency of the truck under test running on its usual fuel, then measured the truck's efficiency again using FPC's own fuel additive, and afterward measured the difference between the two. The fuel supply line and return line of the diesel engine were used to find this difference.

The dataTaker DT80 low power data logger was equipped with 5 to 15 universal analog sensor inputs and 12 digital channels. The stand-alone logger performed the test's measurements at 18-bit resolution and a ± 30 V input measurement range, featuring a dual channel concept enabling up to 10 isolated or 15 common referenced analog inputs to be used in many combinations. The datalogger also featured a built-in display and secure connections via removable screw terminals. High-speed counter inputs, phase

encoder inputs and a programmable serial sensor channel allowed the DT80 to easily connect to most sensors and data measurement sources. Temperature, voltage, current, 4-20mA loops, resistance, bridges, strain gauges, frequency, digital, serial and calculated measurements could all be scaled, logged and returned in engineering units or within statistical reporting. Operators could also group sampling, logging, alarm and control tasks within schedules to fit their needs.

Data management was equally convenient, with the datalogger storing up to 10 million data points in user defined memory so that the operator could log as much or as little as needed with independent control of schedule size and mode. The DT80 also offered the choice to overwrite or stop logging once the allocated memory was full. Data transfer via the logger's extensive communications array included Ethernet, RS-232 communication with PC, SDI-12 and Modbus sensor support, and a USB memory slot. After each phase of fuel consumption testing, FPC allowed the mine's personnel to remove the DT80's USB so that they could use their own onsite equipment to view the comparative data for themselves, thus preventing any claims that the tests had been biased in any way.

Additionally, dataTaker's dEX graphical interface was included free of charge with the datalogger. This user-friendly, Windows Explorer-style software came pre-installed and enabled quick setup and configuration of the datalogger. Suitable for both novice and advanced users, dEX was configured and ran directly from a web browser, accessible either locally or remotely over the Internet. Operators could use any of the logger's built-in communications ports to view dEX, including Ethernet, USB and RS-232.

FPC International benefitted decisively from installing the dataTaker DT80 Intelligent Universal Input Data Logger in its fuel consumption test program. The datalogger had the versatility to measure all the necessary parameters needed to prove that the company's product was in fact more efficient than the mine's existing additive. Data accessibility was a snap: conducting the tests and delivering the USB data in front of the customer strongly reinforced the test's results and substantiated the company's claims to a better product.

Chris Riegel, engineer at FPC International, explained: "It was extremely straightforward to use the dataTaker, and one of the best things we liked about the logger is that it let us quickly get set up onsite and then just let the people there collect all the data themselves using USB. This feature let us avoid any concerns that we, as providers of the fuel additive, were manipulating the data. That really helped us to prove our point that our product outperformed the competition, and in fact we were able to demonstrate a superior effectiveness of nearly 10%." FPC Intl. is currently using dataTaker products in a subsequent fuel testing project following the success of the demonstration in the mine.

Check out the DT80 Intelligent Data Logger's product page at http://dataloggerinc.com/products/DT80_Intelligent_Universal_Input_Data_Logger/3/.



For further information on the dataTaker DT80 Intelligent Data Logger, other data loggers in the dataTaker family, or to find the ideal solution for your application-specific needs, contact a CAS Data Logger Applications Specialist at (800) 956-4437 or visit the website at www.DataLoggerInc.com.

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