

CONDITION MONITORING OF A MINING QUARRY FOR OPTIMAL PRODUCTION

VERSATILE & RUGGED DATATAKER DT80 DOES THE JOB

CAS DataLoggers supplied the data logging solution for a major international building supplies provider experiencing regular downtime in one of their mining quarries. Raw materials were constantly moved using conveyor belts throughout the quarry, and evidence of a problem had surfaced when significant discrepancies between the manually-reported stoppages and the material throughput began appearing. To clarify this issue and to identify the cause of these discrepancies, an automated condition monitoring solution was required for the conveyors' 4-20mA current loop on their belt scales. The solution was required to provide rate monitoring and calculate total tons of material moved per shift. Management needed to compare manually reported stoppages against sensed stoppages and assist in identification of cause. Current throughput monitoring was also needed to enable fast response times to prevent stoppages before they halted production completely. This intelligent solution would also need to feature versatile communications options including USB data transfer for convenient data retrieval and accessibility and also have the durability to survive the challenging environment.



INSTALLATION

Management installed a [dataTaker DT80 Intelligent Data Logger](#) at the top of each conveyor belt in turn for condition monitoring. The DT80 device was then connected to each conveyor's belt scales using 4-20mA current outputs and pulse outputs; the 4-20mA current outputs provided instantaneous rate monitoring given in tons per hour and the pulse outputs returned the accumulated tons.

The cost-effective DT80 was fully expandable to 100 channels, 200 isolated or 300 single-ended analog inputs, and provided low-power operation. The dataTaker device also had the capacity to monitor and log up to 15 current sources using its universal analog sensor inputs; ideal for the 4-20mA signals, and also featured four dedicated high-speed hardware counters, which were used to record the number of pulses from the belt scales. This allowed the client to view each genuine case of stoppage as opposed to the manually-reported stoppages and to quickly identify both their location and causes.

USAGE

Featuring a built-in display and secure connections via its removable screw terminals, the stand-alone DT80 recorded all measurements at a precise 18-bit resolution across a ± 30 V input measurement range, utilizing high-speed counter inputs, phase encoder inputs and a programmable serial sensor channel 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 and logged in engineering units or as statistical values. Additionally, the dataTaker's ease of use enabled operators to group sampling, logging, alarm and control tasks within schedules to fit their needs.

An additional use for the DT80 was to eliminate the bottlenecks in the system to improve throughput. Here the DT80's enhanced web interface enabled users to view graphical indicators, providing the current throughput to the operator. This in turn allowed for corrective action immediately while a problem was developing, rather than the operator having to wait until the crusher was blocked completely, improving productivity. Throughout its use, the dataTaker's rugged design and construction provided reliable operation even in the [mining quarry's](#) extreme conditions.

Managing the data was equally easy: the data logger stored as many as 10 million data points in user-defined memory so that users could log as much as needed having independent control of schedule size and mode. The DT80 also offered users the choice to overwrite or stop logging once the allocated memory was full. Data transfer options via the logger's extensive communications array included Ethernet and USB. Other digital inputs included smart serial sensor channels capable of interfacing to RS232, RS485, RS422 and SDI-12 sensors, and Modbus master and slave functionality allowing connection to Modbus sensors and devices and to SCADA systems. The data logger's built-in web and FTP server allowed for remote access to logged data, configuration and diagnostics, and USB memory stick support offered users another method for easy data and program transfer.

Additionally, dataTaker's user-friendly dEX graphical interface came free of charge with the data logger using a built-in browser-style interface enabling quick setup and configuration. The dEX software was configured and ran directly from a web browser, accessible either locally or remotely over the Internet.



BENEFITS

The mining quarry's operations benefited in several key ways after installation of the dataTaker DT80 intelligent data logger for condition monitoring. The dataTaker had the flexibility to connect to both the current and pulse signals, greatly reducing the conveyors' downtime due to stoppages and significantly increasing throughput. The device's rugged construction stood up to the extreme environment so that the logger wasn't vulnerable in its somewhat exposed position. Additionally, the DT80's extensive communications options enabled hassle-free data accessibility and retrieval. After monitoring throughput on the conveyors, management were able to easily apply this type of application to the quarry's other batch weighing systems and manufacturing processes, increasing productivity throughout the quarry.

For further information on the [dataTaker DT80 Intelligent Data Logger](#), condition monitoring, or to find the ideal solution for your application-specific needs, contact a CAS Data Logger Application Specialist at **(800) 956-4437** or www.DataLoggerInc.com.