

## Application Note – Stress Monitoring of equipment using strain gauges

### Customer Requirements

The client required stress monitoring of a modified support bracket for 800mm x 2000mm blades that each scrapes about 500 kg of coal stockpiles. With more than 100 blades per coal scraper reclaimer machine, validation of the design was important to avoid high maintenance costs and downtime.

In order to characterize the transient loads on the support brackets as the coal is scooped into the bucket it was necessary to log data at the rate of 8 Hz.

The sheer physical size of the reclaimer presented its own unique problems. The rotating scrapers precluded fixing the data acquisition system in a fixed position and the use of telemetry systems using radio and telephone technology were ruled out because of the coal mine's very noisy electrical environment posed the risk of interference with the signal.

### Equipment

DT800

Foam Filled Protective Box

### Sensors

Strain Gauges

### Datataker Solution

The *dataTaker* DT800 logger's stand alone capability allowed the logger to be mounted on the rotating scraper. This unique approach greatly simplified wiring issues and reduced possible sources of electrical noise.

The blade support was hooked up with two rosettes of three gauges at 0°, 45° and 90° orientations.

The DT800 data logger was configured to time stamp to each of the stress readings, which synchronised with the machinery cycle. The logger was encased in a foam-filled box to exclude dust and moisture and bolted to the blade support. The 90 second-cycles were stored by the logger and retrieved at the end of each shift allowing the transfer of data to the engineer's own software on his notebook PC for analysis.

The serial interface used between the notebook and the logger allowed for fast download and the format made post processing simple giving results within minutes.

As a result of the analysis further refinement of the mechanical design was necessary.

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