

## Strain Gauged Rockbolts



### Features

- User friendly
- Rugged fully encapsulated electronics
- Easily installed
- Proven and reliable in harsh mining and civil engineering environments
- directly to a datalogger
- Available in any length between 1.0m and 4.0m

### Applications

Wherever rockbolting is used for support, strain gauged rockbolts can be used to measure the distribution of bolt loads for design purposes. Bolt loads can be monitored along each bolt by the use of multiple strain gauges. Strain gauged bolts are normally placed in an array across the excavation as part of the standard bolt pattern. They are typically installed at the face of the excavation as part of the normal support cycle.

Multiple pairs of strain gauges are embedded at regular spacings along each bolt enabling the axial loads and bending moments to be measured along its full length. ES&S strain

gauged rockbolts provide a valuable tool for monitoring support system performance against design specification. Strain gauged rockbolts are suitable for local or remote reading in potentially explosive atmospheres.

We have many years experience in successful manufacture, supply and installation of high quality strain. Most designs of rockbolt and ground anchor can be instrumented. Our products are rugged and proven in the harsh mining and civil engineering environments. Over 450 per year are currently used in British coal mines.

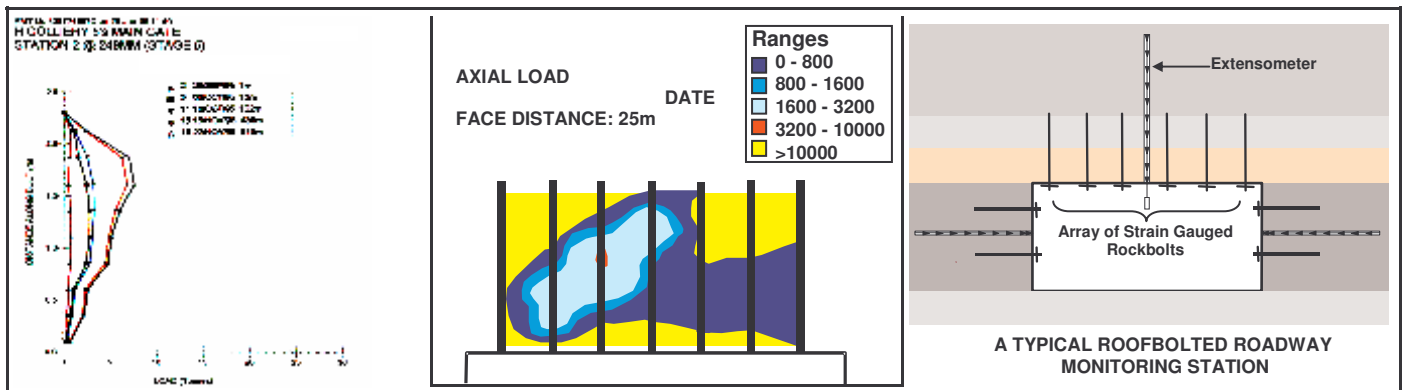


## Operating Principle

Data obtained can be stored and analysed by the "Exbolt for Windows" software package to determine:

- Axial loads and strains
- Bending loads and strain differences
- High strain zones from contour plots.

The following diagrams illustrate results and typical array configuration.



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