CTT EMAG
Centrum Transferu Technologii
EMAG Sp. z o. o.

GRUPA CNP
Centrum Naukowo-Przemysłowe EMAG

ARAMIS M/E

Seismic monitoring system with DTSS digital transmission of seismic signals

Visualisation and processing of data on seismic events in mines

ARAMIS M/E is the intrinsically-safe system to monitor seismic activity during mining. We have been developing our technology for more than 20 years. ARAMIS M/E is ready to operate in extremely hard underground conditions. Nowadays, more than 70 shallow and deep mines are using our system worldwide to provide sustainable exploitation by reducing risk of rock burst.

ARAMIS M/E is equipped with digital transmission of seismic signals (DTSS). This unique solution supplies high quality seismograms even from outlying areas up to 10 km.

The integral part of the system are Aramis Win and Hestia software to seismic event location, seismic source parameters computation and interpretation of the outputs in terms of seismic hazard.

ARAMIS M/E as a modular system can be tailored individually for each mine depending on the on-site conditions. It can work with our two additional geophysical systems: ARP 2000 P/E for surface ground motion analysis and ARES for microseismic monitoring in the vicinity of longwall face.

Scan me!

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ARAMIS M/E

Seismic system with DTSS digital transmission of seismic signals

TECHNICAL DATA

✓ Number of channels per registration unit	up to 16
✓ Signal transmission	digital, binary
✓ Maximum components per one line	3 (X, Y, Z)
✓ Dynamic range	118 dB (1-component) 96 dB (3-component)
✓ Real-time recording types	seismograms of detected seismic events, continuous recording
✓ Power supply of underground transmission station	central, intrinsically-safe from the surface
✓ Maximum transmission distance	typically 10 km, up to 12 km
✓ Data transmission speed in the DTSS	32000 b/s
✓ Sampling frequency	up to 2000 Hz (500 Hz typical)
✓ Enclosures and ingress protection	IP 54
✓ Sensors	- low-frequence seismometers SV*/DTSS and SPI-70 - geophones GVu, GVd, GHa, SG3, SP-5.28/E

Depending on the extent of the mine, the system is based on seismometers or optionally on low frequency geophones. The system uses intrinsically safe data transmission, centrally supplied from the surface, which enables to transmit 1-, 2- or 3-axial velocity movements (X, Y, Z). The sampling of signals is performed by means of 24-bit Sigma Delta converters, providing high dynamics of conversion and recording.

Key features:
- Seismic event location by use of straight ray path assumption or complex 3D velocity model (Bayesian inversion approach)
- Signal processing (spectral analysis, filtering)
- Semi-automated P- and S-wave travel time picking
- Seismic source parameters estiamtion: seismic energy, seismic moment, moment magnitude, focal size, stress drop
- 2D/3D visualisation of seismic events
- Support in seismic hazard assessment

EC-type examination certificate: KDB 04ATEX323

Protection in explosive atmospheres: according to ATEX directives by intrinsic safety
Underground section: I M1 EX ia I Ma
Surface area: I (M1) [Ex ia Ma] I

Conformity marking CE