

SiAMFlex

mining shovel

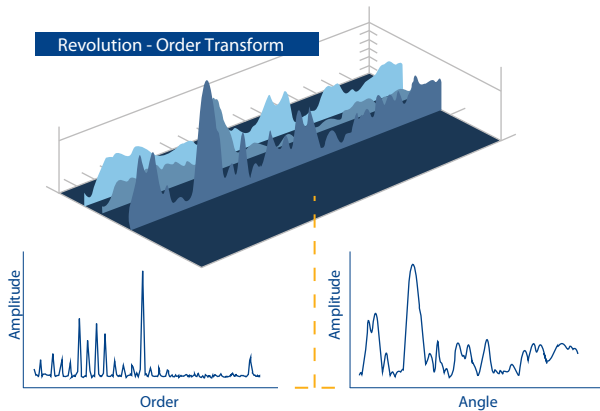
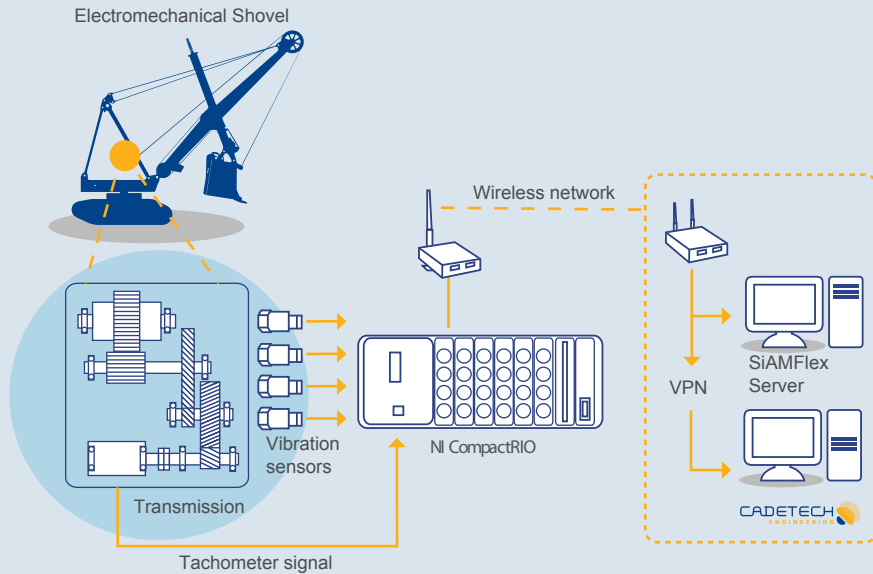


► **SiAMFlex - MS** is a vibration monitoring system specially designed for hoist, crowd and swing transmissions of electromechanical shovels. It monitors the mechanical condition of the transmission components, increasing the reliability and reducing the unscheduled stops.

In contrast to conventional equipment, which are based on Fast Fourier Transform (FFT), the spectral analysis of SiAMFlex is based on a tailor-made spectral algorithm for electromechanical shovels.

Data acquisition and processing hardware is on board of each shovel, which receives the vibration signals from a series of sensors, strategically installed on the components of interest, and from the electrical motor high resolution tachometric signals. SiAMFlex has the intelligence to select and store the most appropriate signal runs for analysis. The data is downloaded and processed automatically for further analysis by specialists.

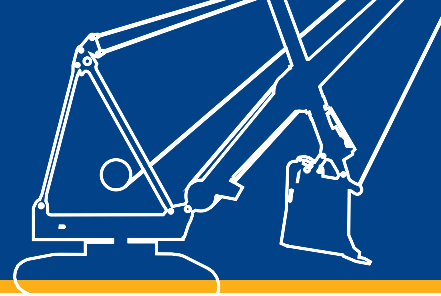
CADETECH also provides diagnostic analysis of the data by a team of knowledgeable engineers with the experience of 8 years and more than 160 reports issued.



NI CompactRIO

Features and benefits:

- Detection and trend analysis of defects and faults in gears and bearings, motor - input shaft misalignment, loosening of components and structural resonance, among others.
- It allows to prevent over 90% of unscheduled stops originated in the monitored mechanical components.
- Reduction over 50% of the MTTR in the components and faults monitored.
- Delivery of objective information for maintenance planning.
- Workers' safety improvement through reduction or elimination of emergency repairs.
- Tolerance to unstable communication networks, which can occur in quarry mobile equipment.
- Robust, rugged and high performance equipment with measurement and monitoring while the shovel is operating normally.
- Tools for spectral analysis, waveforms and speed visualization, global values, trends, warnings, alarms, spectro - temporal 3D algorithms. Other features available on request.
- More than 20 systems installed and running since 2004 for world class mining customers.



► Datasheet

Dynamic analysis channels	
Number of channels	16 to 28
Sensor power	IEPE, 2mA
Sampling frequency	5 kHz, typical
Bandwidth	2.3 kHz, typical
A/D converter	24-bit, delta-sigma, dedicated per channel
Tachogenerator channels	
Number of channels	3 pairs, optocoupled
Signal type	Incremental encoder
Timebase	40 MHz
Reference signal channels	
Number of channels	Up to 16
Range	± 10V
Connection type	Differential
A/D converter	16-bit, multiplexed
Controler	
Communication	Ethernet, IEEE 802.3
On-board storage	3 GB, SSD
Enviromental	
Shock resistance	30g, 11 ms half sine 50g, 3 ms half sine
Operating temperature	-20 a 55 °C
Analysis tool	
Waveform lenght	> 60 s, maximum 12 s, typical
Spectrum lines	> 40.000, maximum 15.000, typical
Trends calculation	RMS, peak, peak-to-peak, average, minimum, maximum, crest factor
Trends calculation base	Waveform, full spectrum, spectral band, spectral component
Advanced techniques	Demodulation, integration, time-frequency transform, revolution-order transform, analysis of amplitude versus operation conditions
Spectral markers	Gearmesh frequencies, rotation speeds, bearing frequencies
Cursors	Harmonics, sidebands