MINING

GET BEST-IN-CLASS WIRELESS CONNECTIVITY WITH MIOTY™

ROBUST
SCALABLE
COST-EFFECTIVE

Driven by intensifying challenges of the volatile commodity market, declining ore grades, rising energy costs and extreme operating conditions, mining businesses are undergoing major digital transformation embracing IIoT technologies. While connectivity is key to harvesting large-scale data in the "connected mine", remote location, extreme depths, confined spaces, and non-symmetric mine topology introduce the most hostile condition for data communication. Wired networks have limited range, are expensive and highly vulnerable to the physical impact caused by in-pit operations of mining equipment. Cellular and short-range solutions such as Wi-Fi fail to deliver sufficient coverage and reliable signals in underground and hard-to-reach sprawling mines.

Drive operational excellence & safety in the connected mine

A field test conducted at NORCAT Underground Centre – the world's premier "active laboratory" for emerging, transformative technologies in the mining industry, has verified outstanding performance of the MIOTY™ network in greatly challenging environments of underground mines. Successful

data connectivity through extreme conditions (i.e. steel doors, ventilation dampers, severe bends and corners, etc.) and 100 percent coverage of the entire mine were achieved with the deployment of only two gateways. Providing 95% potential cost saving over alternative Wi-Fi systems for far better coverage, MIOTY™ now offers mining businesses a highly robust and cost-effective "last-mile" communication to realize your competitive edge with large-scale IIoT deployments.

Use Cases

Seamless connectivity by MIOTY™ fuels massive data inputs that can be turned into actionable intelligence to enhance traceability, productivity and safety while reducing costs and waste in mining operations.

Real-time asset tracking, remote diagnostics & predictive maintenance

As an asset-intensive industry, mining entails a wide-array of equipment from drills, excavators, diggers and conveyors to pumps, motors and fans, which are widely dispersed both above and underground. Providing a dependable mine-wide network, MIOTY™ feeds valuable data streams from numerous embedded sensors (e.g. pressure, vibration, flow rate, temperature) and engine telemetry boxes to enable real-time remote diagnostics, troubleshooting and asset tracking across the entire mine. In combination with analytical models, corrective maintenance and procurement of spare parts can be effectively planned to prevent asset downtime and help companies stay ahead of expensive production losses.

Emission & groundwater level monitoring to enhance safety, compliance & sustainability

Diesel exhaust emitted from underground excavating equipment and drilling machines contain toxic gases and fine particles that present serious health risks. With the adoption of stationary and mobile gas detectors, as well as particle sensors, emission levels and threshold limit values can be effectively controlled to sustain a secure working environment that complies with safety standards.

Chemical residues from mining operations threat to contaminate groundwater and incur serious environmental issues. Sending data from level sensors, MIOTY™ helps mining operators keep track of real-time changes in groundwater levels at mine shafts, especially during rainfalls. Timely and effective pumping can be performed to prevent excessive inflows, thus avoiding contamination and underground flooding.

After-blast monitoring to reduce operational downtime

Following a blast to open up a new site within the mine, the area is often filled with toxic fumes and debris. Waiting hours to ensure blast fumes completely clear out can lead to costly operational downtime. Having an environmental monitoring system in place within a MIOTY™ network,

operators and miners will stay informed when an area is safe enough to resume work. Unnecessary wait times can be cut down, thereby enabling a faster turnaround after blasts and increasing productivity.

Wearable-based event reporting & rock bolt monitoring to improve worker safety

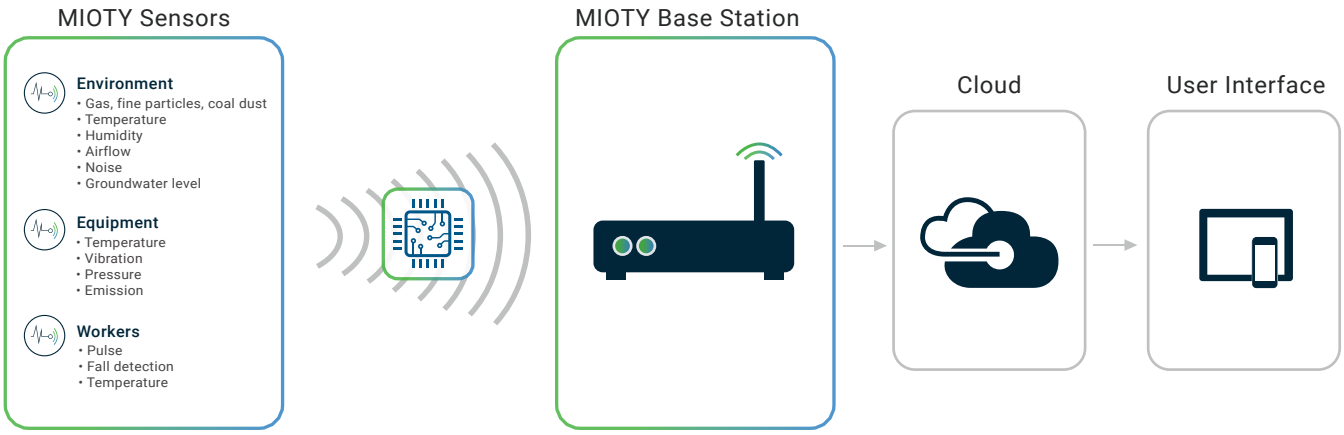
As mines are renowned to be among the most dangerous working environments with high risk of explosions, equipment accidents and toxic exposure, ensuring miners' health and safety has always remained a big challenge. With the help of MIOTY™ enabled-wearables, miners' health status and working environment (i.e. temperature, humidity, radiation, noise and gas levels) can now be tracked in real-time. Managers are immediately notified of fatigue, exhaustion, and "out-of-tolerance" incidents experienced by their workers, while miners will receive timely warnings in the event of potential hazards. Similarly, sensors monitoring seismic activities in underground mines can be installed on rock bolts to effectively assess their integrity and reduce fatal risk of ground falls.

Ventilation-on-Demand (VoD) for optimized energy efficiency

Ventilation can account for 30-40% of energy consumption in underground mines. Supporting implementation of VoD systems, MIOTY™-enabled atmospheric sensors can be leveraged to constantly monitor air quality and air flows at different areas in the mine for remote adjustment of fan speed. Transmitting data from occupancy sensors or worker registration data from NFC tags, MIOTY™ ensures that ventilation is activated only in current work zones where miners are present. This results in a 30% potential energy saving, thereby remarkably reducing operational costs and environmental footprint.

MIOTY™ in Action

Feeding Massive Data for Real-time Analytics & Visualization



Why Choose MIOTY™?

WORLD-WIDE OPERATION
Leverage the globally compatible ETSI standard for low throughput networks

SECURITY & DATA PRIVACY
Retain full data ownership with private networks incorporating multi-layer security

OPEN SOLUTION
Flexibly choose your transceivers, gateways and application platforms

COST EFFICIENT
Reduce TCO with less infrastructure requirements, low device costs and simple maintenance

EASY TO INSTALL
Retrofit IoT Solutions in brownfield applications with effortless network configuration & setup

MIOTY™

LONG RANGE
Operate 5 km in urban & up to 15 km in rural area and cover cellular 'blind spots'

LOW POWER
Support up to 20-year battery lifetime

HIGH SCALABILITY
Aggregate 1.5 million messages a day using only a single gateway/base station

QUALITY OF SERVICE
Achieve industrial-grade reliability with unrivalled interference immunity & deep indoor penetration

EXCEPTIONAL MOBILITY
Administer nodes at 120 km/h velocity

About BTI

Founded in 2018, Toronto-based Behr Technologies Inc. (BTI) is a worldwide licensee of MIOTY™, the leading wireless communication technology for Industrial Internet of Things (IIoT). The company is focused on commercializing, licensing, and supporting the MIOTY technology through partnerships with industry-leading technology providers, and the development of new MIOTY-based products and applications for the IIoT marketplace. BTI's first commercial product using this ETSI standard is the MIOTY 1.0 Starter Kit with Microsoft Azure, which was launched in April 2018 at Hannover Messe, Germany.

For more information, visit:
www.behrtechnologies.com