

Digital Voice and High Speed Data at the Working Face



Location: Sudbury, Ontario, Canada

The Customer:

NORCAT was founded in 1995 by a team of business and academic visionaries who recognized the need for an organization to promote, educate, and support local entrepreneurs, tech innovators, and skilled labour workers to enable long-term and sustainable economic and social prosperity for Northern Ontario.

Venue:

Located in Sudbury, Ontario, the NORCAT Underground Centre is an underground operating mine that serves as both an innovation and training centre providing two services:

- Technology Development, Testing & Demonstration
- Experimental, Hands-on Training & Development

Problem:

Underground mining operations, often found in remote and hazardous locations, face a myriad of unique communication challenges. From signal obstacles and harsh environmental conditions to excessive noise and lack of redundancy, these issues not only affect worker to worker communications, they also limit effective personnel tracking, emergency management and safety measures.

Communications within the mine and from 'underground to surface' has traditionally been enabled using two-way radio frequencies over an antiquated, single 'Leaky Feeder' radiating cable network. These networks provide basic two-way radio voice communications however, they do not address communications at the working face of the mine where the production takes place.

Furthermore, independent networks are always required to address air quality management, TeleOp for remote control of equipment and ground control systems.

Solution Overview:

- Rajant Kinetic Mesh® wireless technology
- Mutualink GO Kit with LNK360 software
- Sonim Technologies XP10 Rugged Handheld Smartphones

“As a leading wireless technology distributor, Crossover is proud to have collaborated with our key vendor partners, Rajant, Mutualink, and Sonim Technologies to create such a unique solution to address age old communication challenges in the mining industry.”

Darin Gibbons

Executive Vice President

Crossover

Project Details:

Proof of Concept at the NORCAT mine to demonstrate how to extend wireless communications from the existing Leaky Feeder system into the working face of the mine over wireless Kinetic Mesh technology using a gateway that crossbands VHF signals to 2.4/5 GHz signals.

Solution:

- Rajant Hawk wireless nodes, known as BreadCrumbs® and a Mutualink GO kit for the infrastructure
- Sonim Technologies XP10 rugged smartphones enabled with Mutualink's LNK360 Push-to-Talk (PTT) application
- A single VHF Two-Way radio to connect to the Leaky Feeder network

Rajant Kinetic Mesh BreadCrumbs were strategically placed in the drift alongside and past the existing leaky feeder system to extend coverage into the working face. The Mutualink GO kit was installed on the surface and into the wired portion of the Rajant network. A second port from the GO kit was used to interface with a VHF radio, providing a wireless connection to the leaky feeder system.

Result:

Within 15 minutes of deploying the aforementioned solution, full wireless communications was immediately established between workers in the mine using handheld portable VHF radios and miners working at the face of the mine, who were equipped with Sonim smartphones using PTT functions.

Basically, when a smartphone user pushes the PTT button, the VHF radio channel is activated and the radio users hear the smartphone's broadcast over the leaky feeder system. When a radio user pushes the PTT button, the voice signal is broadcasted over the wireless Mesh network to the smartphones.

Additionally, miners using Sonim smartphones at the working face were able share live video feeds to the surface and beyond. This also solves the communications issues with a lone worker at the face.

This technology is agnostic and is an interoperable solution that can connect to any leaker feeder system, regardless of the frequency band being used. This solution enables new VoIP phones and existing handheld portable radios to communicate with each other. It allows mines to continue expansion of present technology into additional areas of the mine while simultaneously leveraging existing leaky feeder systems.

Employees will benefit from mine wide communications by simply installing a Rajant BreadCrumb on mobile equipment such as drills, loaders or trucks, effectively making the machine a wireless hot spot.

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