

## LKAB — Luossavaara-Kiirunavaara Aktiebolag



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Country: Sweden  
Location: Malmberget  
Industry: Mining  
Employees: 3,500  
  
Readers: 7  
Tags: 1,000  
  
Website: [www.lkab.se](http://www.lkab.se)



### THE CHALLENGE

Luossavaara-Kiirunavaara AB (LKAB), one of the world's leading producers of upgraded iron ore products for the steel industry and a growing supplier of industrial minerals products to numerous other sectors. Malmberget is an area located inside the Arctic Circle, 70 kilometres south of Kiruna, Sweden. Nestled within this remote area is also the home of LKAB's Malmberget Mine.

In 2003, in an effort to provide the ultimate safe work environment for their employees as well as improve operational efficiency, LKAB selected the IDNENITEC SOLUTIONS, WatcherMine safety system to address their concerns.

LKAB determined that the system would have to meet the following requirements:

- Provide an accurate headcount and location of all personnel and vehicles both underground and outside.
- An accurate and verified check in/out of workers as they pass through gates in buses.
- A warning or "empty mine" feature before blasts (every day).
- A timed and alarmed "work alone" feature that would allow workers to be given a predetermined timed to when they must exit the mine, that when exceeded would trigger an alert.
- Instant access to control schedules that also would trigger alarms when unauthorized workers were in restricted areas.
- Automatic routing of alarms to the correct recipients.

### THE SOLUTION

By using their proprietary WATCHERMINE applications in combination with ILR®-enabled wireless technology, IDENITEC SOLUTIONS effectively deployed a solution where all assets - including; miners, guests, contractors and vehicles were equipped active RFID tags complete with a unique ID. The system was setup with several "access points" installed at strategic locations throughout the mine. The Site Survey revealed a need for 12 zones- which translated to one zone "outside" and 11 zones underground.



A detailed Map edit tool allowed for the placement of physical components on the same map background as an employees location to provide a real-time visualization on the whereabouts of all assets.

The system utilizes several "access points" installed at strategic locations throughout the mine. Each active RFID tag's unique ID, is recognised and recorded when it enters the read range at the access points. Tag to antenna read range is approximately 100 metres. The flexibility of the WatcherMine system enables coverage of large zones using multiple readers/antennas.

Earlier tests had showed that an accurate reading of busloads of personnel travelling through a gate at high speed, could only be achieved using ILR® active tags. The 433 MHz equipment operates on an open frequency - and tests results indicated that third party

equipment could cause interference, resulting in less than 100% accuracy. WLAN tags had also been tested, but the slow response time (>15 seconds/tag) delivered poor results. To offset this issue, LED displays were installed at the main entrance for rapid verification of the number of workers inside a bus which were additionally verified by the bus driver. LED displays were also installed underground for verification of reading when entering a new zone displaying the name of the worker and/or vehicle. The test period ended in 2004 with the results demonstrating that the system not only met the initial requirements, but was also found to dramatically improve evacuation and rescue procedures.

In 2004 the LKAB released a news bulletin that described the system as follows: "...for the rescue service the system is of great help if an incident should occur. A sort of flight-recorder that shows the last location of personnel. For us, the system is a priceless tool...In the case of a fire or another incident, we can quickly obtain an overview of the situation, locate and identify the personnel that have not managed to get to a safe zone, and use this information for faster and more accurate rescue..."

#### BENEFITS

- Rapid location of personnel, vehicles or tools/equipment
- Automated check in/out procedure, no longer need to empty bus for personnel to swipe access cards
- Reliable headcount in real time, vital input when decision to blast is made
- Improved operational efficiency in day-to-day operations
- Improved handling of evacuation in emergency situations
- Faster and more accurate response from rescue teams in emergency situations

#### THE TECHNOLOGY

ILR® hardware components include a data carrier: i-Q8 Tag, read/write station: i-PORT and Antenna. The equipment was installed in ruggedized cabinets, with UPS backup and redundant data networks.

The WATCHERMINE presentation software, in combination with the TRAILBLAZER middleware, uses a distributed architecture for seamless integration with the existing software applications, databases and integration with 3rd party hardware like CCTV cameras and LED displays.

- i-B Tag: The ILR® active tag (data carrier) is designed to be worn by personnel or mounted on vehicles and equipment. It allows for clear, reliable identification, automatic communication and anti-collision algorithms.
- i-PORT: This read device provides read capabilities for tags and ensures seamless integration. Various configurations are available to provide scalability and interoperability.
- Antenna: Connected to the i-PORT, the antenna allows for contactless communication from the tags with a range of up to 100 metres. The antenna provides high performance and flexibility, with the identification area easily adjusted to suit a particular zone.
- WATCHERMINE/TRAILBLAZER: Collects data from tags and 3rd party hardware, triggers events to 3rd party hardware, displays collected data in a user friendly fashion. Delivered with modules such as: MAP, SEARCH, ALERT, REPORT, DISPLAY, CCTV and ACCESS CONTROL.

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