

# The right place at the right time

MineSuite *IntelliTags* represent a new generation of location tracking and relative positioning technology to replace traditional RFI technology underground.

In most traditional underground mechanised mines, RFI tags have been used in recent decades for equipment tracking. This technology has inherent limitations in that the tags are merely location beacons with a short range, and are heavily dependent on tag layout in the mine workings.

MinLog developed MineSuite's new *IntelliTags* to provide for underground production management and higher-level business decision requirements.

MineSuite *IntelliTags* are built around the Nanotron Swarm Bee technology that allows for accurate ranging through time of flight calculations and meshing capability. This is combined with on-board MineSuite Field Computer Equipment to provide ground breaking capability for proximity awareness, traffic management, equipment and product tracking. It significantly reduces the requirement for traditional communications infrastructure.

Real-time operator location and position awareness is enabled even in areas with no communication infrastructure, thereby eliminating latency and failure points common to the environment.

## Locations

Locations in the mine are tagged with *IntelliTags*, and a vehicle's position is determined based on recognition of any one of these tags. This allows production tracking, for instance, through active validation of assigned or planned production sources such as stopes, and destinations such as ore passes and stockpiles for haul cycle detection.

Material flow can be tracked from stopes (sources) to tips (destinations) to prevent or highlight incorrect tipping. An on-board message alerts the operator to relocate to the correct location.



Depending on requirements, individual tags can be provided with virtual ranges; tag settings do not need to be altered, but the on-board equipment associates a specific tag with a particular range.

## Positioning

Positioning can also be in relation to other equipment. For example, when a truck is assigned to a loader which is working at an intermediate and untagged location, the truck will register that it has arrived at the desired source. The loader acknowledges the arrival of the truck assigned to it, thereby automating the activity cycle.

Tags communicate directly with each other, and the ranging capability allows calculation of the distance separating the tags.

This ranging technology provides an underground line of sight in excess of 200 m for each vehicle. It also covers haulage around corners, and is enhanced by the capacity to mesh. In practice, a stand-alone tag is placed at an intersection; two approaching vehicles can determine their position in relation to the intersection tag and thereby communicate their distance from each other.

## Delays

Tracking of operational and engineering delays is achieved through on-board capture and detection of locations such as workshops and fuel bays. The system identifies the presence of equipment in a location and applies associated business rules based on a sequence of events. For example, shutdown in a fuel bay can be used to measure refuelling delays or even queuing time.

## Deployment

MinLog has completed pre-production trials of the technology, with the first deployment planned for November 2018. The ability to progress from a technology test bed to a production environment inclusive of related operational software is a result of the relationship with industry partners such as AngloGold Ashanti, as well as technology partners, Nanotron and EDM.

Taking advantage of the latest technology enables an operation to improve safety and productivity. Knowing the location and status of all equipment at any time allows intelligent decisions to be made to avoid and minimise delays.