



IMPACT

The FUTURE of mining communications

Proximity Detection



Productivity & Safety through
Mine-Spec digital applications

- Asset & Personnel interaction monitoring
- Multi-zone detection
- Multiple external triggers
- Data logging for incident reports



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Proximity Detection

The ImPact technology suite is designed to lead mining communications and digital infrastructure into the future. The ImPact Proximity Detection system has been developed with the support of a number of hard rock and coal mining companies and the Australian Coal Association Research Program (ACARP) to function reliably within the harsh environments encountered in underground mining.

The ImPact Proximity Detection system is a cost-effective method of alerting vehicle operators to other vehicles and personnel in their vicinity, reducing the risk of collisions and thus improving the safety of all personnel. The system distinguishes between close-in proximity (“Inner Zone”) and in-vicinity (“Outer Zone”) to facilitate proximity-appropriate responses from the vehicle operator.

The system combines the ImPact Vehicle Intelligence Platform (VIP), active RFID tags mounted in cap-lamps or on mobile assets, and magnetic field generators to create a multi zone proximity warning system. The VIP module is connected to an

in-cab, rugged touch screen display and both audio and visual alarm systems to warn the operator when a presence has been detected. The system then interprets the detected tag details, confirming tag information or identity, and position within the detection field (either outer or inner zone). The information is displayed on the in-cab touch screen display, and the operator can then acknowledge awareness by simply touching the screen to silence the alarm.

The ImPact proximity detection system is a simple yet effective way to reduce risk and increase safety in any underground mine.

Features and Benefits

Applications

Proximity Detection
Incident logging
Collision risk reduction
Access control

Active RFID Tags *State-of-the-art Wi-Fi signals propagate for 60m in underground roadways and importantly can travel 20m – 40m around corners.*

Multiple zone detection *Outer Zone gives first warning and creates awareness. Inner Zone gives critical “Collision Imminent” warning. Inner Zone utilises adjustable magnetic field generated around the vehicle, which improves repeatability. Inner and Outer Zone alarms customisable to minimise driver irritation.*

Logging and auditing *Provides “black box” functionality to facilitate the investigation of incidents. Ability to connect to server and upload logged events.*

Continuous self diagnostics *System uses built-in feedback tags to continuously self-check all critical system components.*

Designed to leverage existing MST equipment *Proximity Detection is one Personality of the ImPact Vehicle Intelligence Platform. Once this hardware is installed, it can also be used for vehicle diagnostics, payload monitoring and other productivity enhancing applications. Proximity tags are usable with the ImPact tracking and tagging system.*



ImPact Proximity Detection system with configurable alarms and event logging

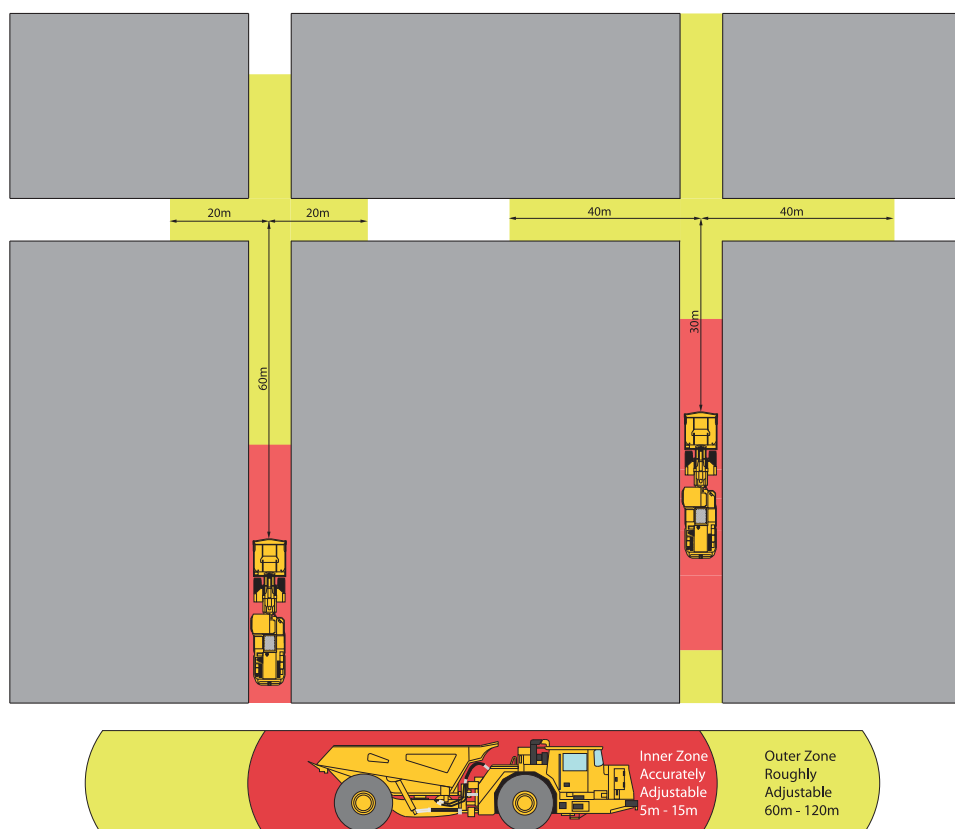
The ImPact Proximity Detection system is designed to significantly reduce the risk of vehicle/person and vehicle/vehicle collisions by providing an early warning indication to vehicle operators of the number of vehicles and personnel present in the vicinity. At the heart of the system is the powerful Vehicle Intelligence Platform (VIP) unit which controls the detection zones and reads tag signals, as well as being a wireless bridge that can connect to ImPact WLAN networks if required.

The system was designed through extensive consultation with vehicle operators and mine safety personnel to provide the highest level of safety and reliability, while taking special account of operator comfort and rugged mine conditions. The multi-zone concept minimises false alarms by giving operators a low-level, non-invasive first alert when a person or another vehicle is within 60m-120m of a vehicle, and a high-level audio/visual red-alert when the Inner Zone around the vehicle

is breached. Detected tags can be silenced either individually or simultaneously, by simply touching the rugged, in-cab screen.

The system uses state-of-the-art Wi-Fi RFID tags which are proven to propagate well underground. The Wi-Fi signals propagate especially well around underground corners, allowing operators to “see around” corners so they are not compromised by someone suddenly entering their roadway. In contrast, traditional UHF/VHF systems have significant limitations in this area.

The Proximity Detection system is suited to both heavy and light vehicles. As a stand alone system it provides increased safety while at the same time it can be further enabled for other IP applications such as in-cab VoIP, vehicle load monitoring, operational data and tracking information by integration in to a mines underground LAN.



ImPact VIP unit

- Controls all proximity alarms in fail safe configuration
- Continuous self diagnosis, checks system, connections and Wi-Fi integrity
- Capable of running several personalities including Asset Tracking and Vehicle Intelligence
- Local logging of recent events for incident investigation
- Wi-Fi connectivity bridges wired Ethernet devices to the network



Inner Zone field generator

- Creates repeatable magnetic “halo” around vehicle
- Heavy duty construction to ensure ruggedness
- Maximum protection against rock falls, heat, protruding metal objects and corrosive environments



Rugged touch screen

- Provides information at a glance to reduce distractions
- Shows number and identity of personnel and vehicles in vicinity split by zone
- Allows for one touch acknowledgement of a single tag or all tags together
- Adjustable alarm volume accommodates operator without compromising safety



Active RFID tags

- Tags are incorporated into lamp ensuring that personnel are always carrying tag
- Integrated PED text pager and optional UHF/VHF radio
- Lightweight Li-Ion battery
- Self contained tag with replaceable battery

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The FUTURE of mining communications

Network Infrastructure

- Takes your LAN underground cost effectively
- Forms the foundation of the ImPact portfolio
- Enables remote monitoring and control of equipment
- Allows easy and modular design of underground networks
 - Facilitates wireless data communications and VoIP
 - Reads Wi-Fi tags to support location aware application
- Rugged IP66 housing designed for the mine environment



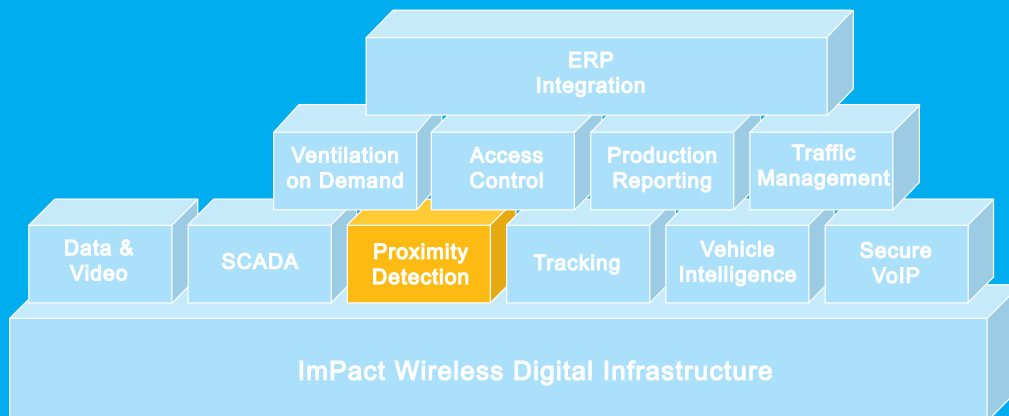
Vehicle Intelligence Platform

- View vehicle diagnostics in real-time
 - Payload data in real-time
 - Acquire vehicle location data
- Report productivity information with greater accuracy
- Integrate with leading manufacturers' equipment (Such as Caterpillar etc)
 - Compliments your existing Mine Site Technologies Ethernet system



Asset Tracking

- Locate and track personnel and asset movement in real time
- Quickly identify and locate all personnel in crisis situations
 - Manage mine assets more effectively
 - Identify bottlenecks and efficiency deficits faster
 - Control area access
- View vehicle location data
- Increase control of personnel / vehicle interactions



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