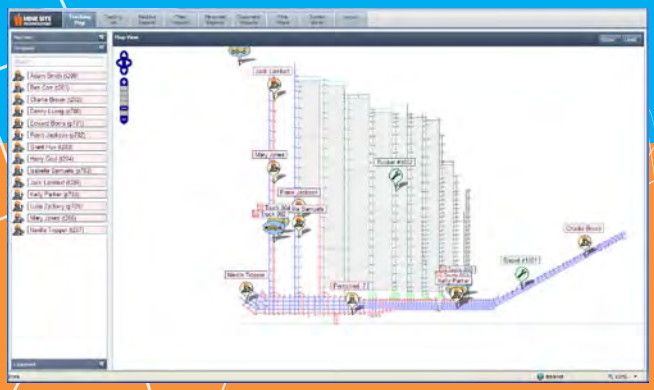
MINE SITE TECHNOLOGIES

IMPACT

The FUTURE of mining communications

Vehicle Intelligence Platform



Productivity & Safety through Mine-Spec digital applications

Time-stamped vehicle diagnostics & payload data
Integrated proximity detection
Location awareness
Mine management data

ImPact

Vehicle Intelligence Platform

The ImPact technology suite is designed to lead mining communications and digital infrastructure into the future. The ImPact Vehicle Intelligence Platform (VIP) has been specifically designed for the mining industry to acquire and report critical operational information, vehicle data and enable proximity detection. The system has been design to withstand the harsh environments encountered in all types of mining from underground to surface operations.

The ImPact Vehicle Intelligence Platform (VIP) is a cost-effective step towards improved vehicle management and productivity gains, by monitoring vehicle location, payload and other required parameters. The vehicle data is combined with mine location, enabling the generation of accurate reports based on real time position and movement trend data. This increases the accuracy and relevance of reports, leading to efficient identification of bottlenecks and advanced planning of vehicle maintenance. All the elements increase productivity through reduced down time and lower maintenance costs.

The VIP unit connects to the vehicle's electronic sensors and monitors specified parameters such as payload, engine data, diagnostics and location details. This information is then transmitted wirelessly to a central server as the vehicle moves throughout the mine. If a vehicle moves outside the coverage of the wireless network the VIP unit will buffer the data for up to seven days, then upload the data as it returns within range. The information is viewable on easily customisable screens, where trending and alarms can be quickly and simply set up. The data collection and reporting software can be installed at the mine or hosted and operated by Mine Site Technologies (MST) or integrated into well known mine reporting systems.

Applications

- Real time vehicle tracking
- Traffic management
- Remote payload monitoring
- Proximity detection
- Vehicle diagnostics
- In Cab VoIP communications
- Tire pressure monitoring

Features and Benefits

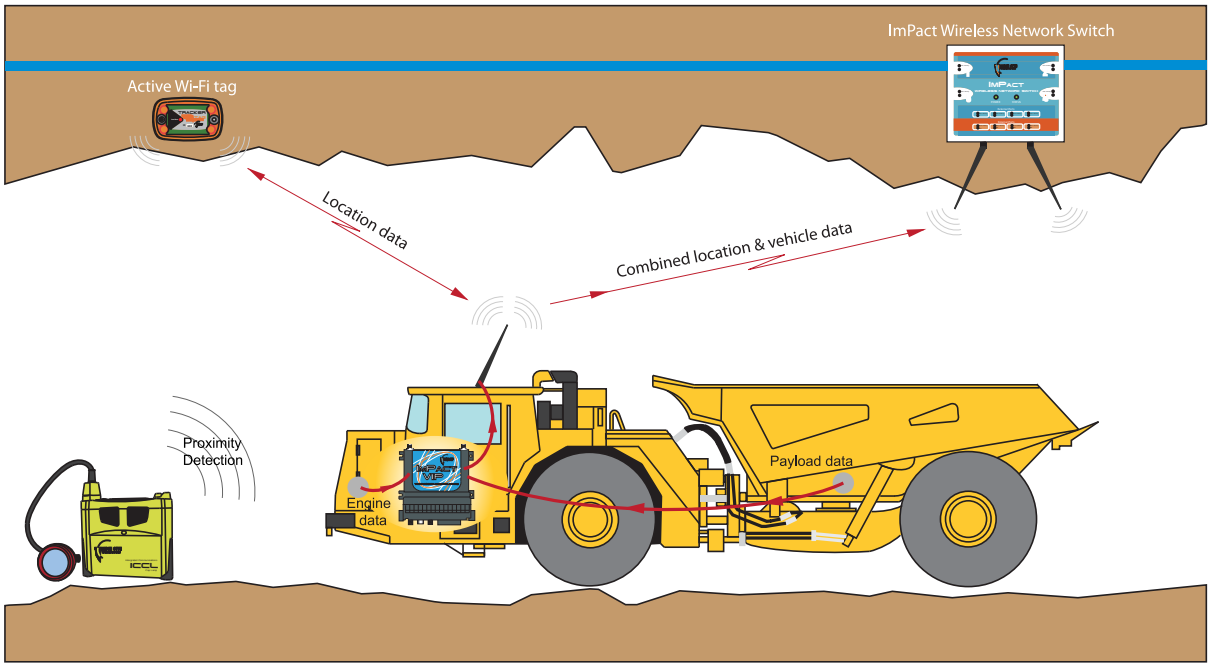
Automated data collection	Removes operator intervention and improves accuracy.
Asset tracking	Quickly identify inefficiencies. Real time tracking of vehicle movements. Reduce down time through reliable knowledge of where your assets are.
Location-aware real time payload data	Increased accuracy in load to surface tallies. Correlation of load and dump data with location information. Early identification of vehicle defects and maintenance planning, reducing downtime.
Plugs into a vehicle's existing wiring harness	Faster deployment with lower maintenance cost Improved system up time. Compatible with major vehicle manufacturers.
Smart functionality for data logging	Able to log data when out of network coverage and upload upon return, creating greater data accuracy.
Wi-Fi Bridge	Allows any Wi-Fi enabled device in the cab to be connected to the wireless network (e.g.VoIP, Tablet PCs, mobile video etc). Unified single system removing the need and associated costs for multiple systems.
Machine vendor independent	Data from different heavy equipment vendors is reported in a common format with a consistent interface.
Availability of data integration API's	Data can be easily transferred into existing core systems.

Typical ImPact VIP monitoring system

The ImPact VIP monitoring system is designed to extract and combine vehicle data with location information. This combined data is sent, wirelessly, to a central server for interrogation and access with MST's simple web based viewing software or other compatible third party applications. This provides simple access to the data required to make accurate decisions affecting the productivity of a mine and ultimately reducing the cost per tonne.

The innovative design of the VIP unit enables seamless integration with major vehicle manufacturers' proprietary systems. Once installed, the unit will constantly monitor and log data in real time from a variety of sources on the vehicle as well as the location tags. The data collection software manages the information from each VIP module. It also supports simultaneous uploads from multiple VIP modules whilst managing the network bandwidth, preventing congestion. Active RFID tags are placed strategically throughout the mine enabling the VIP unit to be aware of its location, aiding the analysis of load tallies and identification of operational bottlenecks. The VIP unit can also act as a data logger, in the event of a vehicle travelling to an area without network coverage, storing data for up to seven days. The stored data is collected immediately a vehicle returns to a covered zone.

The VIP unit acts as a wireless bridge enabling a variety of in cab IP applications such as VoIP, tablet PCs and mobile video. The VIP unit can also form the heart of a powerful Proximity Detection system when used in combination with MST's Integrated Communications Cap Lamp (ICCL).



VIP Data Logger

- Vehicle diagnostic support: Caterpillar EAM, Modbus
- Payload information support: Caterpillar TPMS, Elphinstone TPMS, Loadrite, Modbus
- Location awareness support access point association, Wi-Fi Tag reader
- Able to interface with tire management systems
- Local buffering: can hold up to one week of data before transfer to the network
- Multiple I/O - 4 x serial ports, 2 x CAN ports, 4 x digital in, 3 x analog in and 4 x digital out
- Modular architecture allows new logging profiles to be quickly developed
- Bridges wired Ethernet devices to the wireless network

Active RFID Tag

- Available as an integrated option with MST's Cap Lamp or a self-contained device with a replaceable battery
- Transmits: unique ID, battery level and checksum data

VIP Viewing Software

- Powered by MST's MineDash software
- Fully customisable web-based GUI
- Real time data display
- Powerful trending of historical data
- End user driven ad-hoc reporting

VIP Data Collection Software

- Manages the data collection process from VIP modules
- Supports simultaneous upload from multiple VIP modules
- Efficiently manages the network bandwidth ensuring the network is not flooded by device uploads
- Cross platform availability (Windows and Linux)
- Supports MS-SQL or PostgreSQL for data storage

ImPact

The FUTURE of mining communications

Network Infrastructure

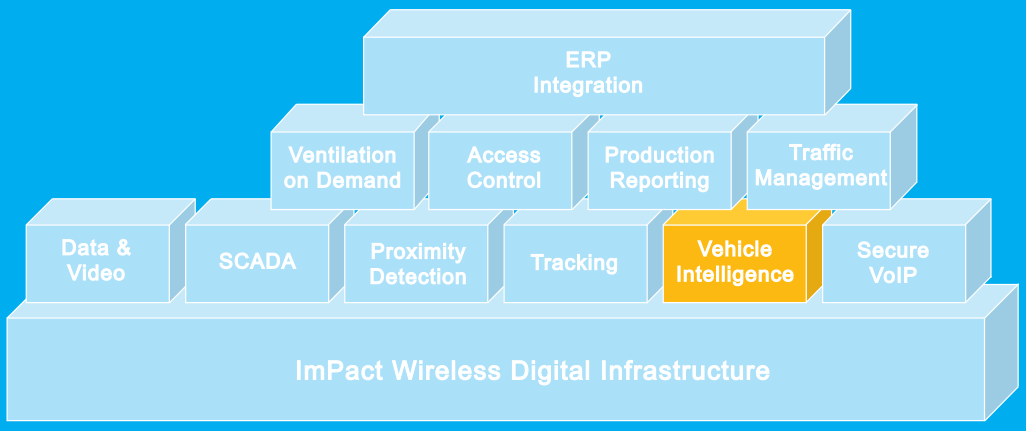
- Takes your LAN underground cost effectively
- Forms the foundation of the ImPact portfolio
- Enables remote monitoring and control of equipment
- Allows easy and modular design of underground networks
- Facilitates wireless data communications and VoIP
- Reads Wi-Fi tags to support location aware application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

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

Proximity Detection

- Reduce risks in personnel / vehicle interactions
- Minimise communications to control room
- Notify operators instantly in-cab



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