Productivity and Safety through Mine-Spec digital applications

- Time-stamped vehicle diagnostics & payload data
- Integrated proximity awareness
- Integrated location tracking
- Mine management data
- Integration into third party FMS
The IMPACT technology suite is designed to lead mining communications and digital infrastructure into the future. The IMPACT Fleet Intelligence Network has been specifically designed for the mining and tunnelling industries to acquire and report critical operational information, vehicle data and enable proximity awareness.

The IMPACT Fleet Intelligence Network (FIN) is a cost-effective step towards improved vehicle management and productivity gains. The FIN system allows real-time vehicle data from a mine’s fleet to be streamed through to surface software applications, such as fleet management and dispatch systems. The FIN connects to the vehicle’s electronic sensors, accurately monitoring specified parameters such as vehicle location, payload, engine diagnostics and other required parameters from both production and maintenance perspectives. This enables the generation of accurate reports based on real-time position and movement trend data, increasing the accuracy and relevance of reports, leading to efficient identification of bottlenecks and advanced planning of vehicle maintenance.

Basic reporting of performance, such as load cycle times and variations to plan can be monitored and reported in the IMPACT ICA/MineDash software. Where more advanced Fleet Management Systems (FMS) are used, FIN directly interfaces and automates the upload of data into these systems, to eliminate the need for unreliable manual input or inaccurate data being used by the FMS.

All these elements increase productivity through reduced down time, lower maintenance costs and delivery of highly accurate data.

**Applications**

- REAL TIME VEHICLE TRACKING
- TRAFFIC MANAGEMENT
- REMOTE PAYLOAD MONITORING
- PROXIMITY AWARENESS
- VEHICLE DIAGNOSTICS
- IN CAB VOIP COMMUNICATIONS
- TIRE PRESSURE MONITORING

**Features and Benefits**

**AUTOMATED DATA COLLECTION & ON-BOARD PROCESSING**
- Removes operator intervention and improves accuracy
- Differentiate data & buffer until in Wi-Fi range

**ASSET TRACKING**
- Quickly identify inefficiencies
- Real time tracking of vehicle movements provides reliable location knowledge

**LOCATION AWARE REAL-TIME PAYLOAD DATA**
- Increased accuracy in load to surface tallies
- Correlation of load and dump data with location information

**MACHINE VENDOR AGNOSTIC**
- Interface to a large range of OEM makes & models in a common format with a consistent interface

**AVAILABILITY OF DATA INTEGRATION APIs**
- Data can be easily transferred into existing ERP or FMS systems

**CUSTOMISED REPORTING**
- Pro actively manage operations with mine-specific reports e.g. production against plan & load cycle times
- Early identification of vehicle defects & maintenance planning, reducing downtime

**PLUGS INTO A VEHICLE’S EXISTING VIMS**
- 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 & upload upon return, creating greater data accuracy

**FMS VENDOR AGNOSTIC WI-FI BRIDGE (VIP)**
- Unified single system removing the need for, & associated costs of, multiple systems
- Allows any Wi-Fi enabled device in the cab to be connected to the wireless network (e.g. VoIP, Tablet PCs, mobile video etc)
- Ensures reliable connectivity to mine’s Wi-Fi network
Typical IMPACT FIN monitoring system

The IMPACT FIN monitoring system is designed to extract and combine vehicle data with physical location information. This is enabled by the Vehicle Intelligence Platform (VIP) data logger/Wi-Fi bridge. 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 from the Wi-Fi tags.

The VIP unit ensures information is reliably transmitted wirelessly to the network and onto the central server as the vehicle moves through the mine. If a vehicle moves outside the coverage of the wireless network the VIP will buffer the data for up to seven days, then upload the data as it returns within range. All information is easily viewable on customisable screens, where trending and alarms can be quickly and simply set up.

All data is sent to the central server for integration and access with MSTs’ simple web-based viewing software, or other compatible third party applications. This provides efficient access to the data required to make accurate decisions, directly affecting the productivity of the mine and ultimately reduce the cost per tonne.

The data collection software manages information from each VIP module and also supports simultaneous uploads from multiple VIP modules whilst managing the network bandwidth, preventing congestion.

Active RFID tags can be 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 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 Awareness system.

Designed specifically for underground mines and tunnels, the FIN provides a total system, from on-board data loggers/Wi-Fi bridges (VIP) module through to network and software interfaces.

VIP DATA LOGGER
- Decodes the following: J1939, J1587, VIMS, EAM & Modbus Protocols
- Interfaces to CAN, J1708 & RS232
- Location awareness support - access point association
- Wi-Fi Tag reader
- Able to interface with tire management systems
- Local buffering: can hold up to 2GB (non volatile) before transfer to the network
- Multiple I/O - 4 x serial ports, 2 x CAN ports, 4 x digital in
- Modular architecture allows new logging profiles to be quickly developed
- Bridges wired Ethernet devices to the wireless network

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
- Interfaces to a number of common FMS systems
- 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

VIP ACTIVE RFID TAG
- Transmits: unique ID, battery level and checksum data

Fig1. Fleet Intelligence Network.
The FIN system, when enabled by the IMPACT network, can provide multiple functionality, from tracking and proximity awareness through to supporting vehicle management systems.

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**Network Infrastructure**
- Built on IMPACT NS50 Wireless Network Switch
- 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 Awareness**
- Reduce risks in personnel / vehicle interactions
- Minimise communications to control room
- Notify operators instantly in-cab

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**MST offices and support centers are strategically located in the world’s primary mining regions.**

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