



Productivity and Innovation through  
the Digital Transformation of Tunnelling

# IMPACT<sup>™</sup>

tunnelling  
solutions



Secure, reliable networks that deliver operational technology platforms

Multi-service communications enable collaboration and rapid decision-making

High reliability infrastructure with a redundant design

Personnel, machine and equipment positioning deliver business value

High speed data access to TBMs and roadheaders for optimisation

## Applications

**FIXED AND WIRELESS COMMUNICATIONS**  
**BROADCAST EMERGENCY MESSAGING**  
**DATA ACQUISITION DEVICES FOR ROADHEADERS**  
**ADVANCED NETWORK PLATFORMS FOR TBMS**  
**CONVERGED VIDEO SURVEILLANCE**  
**WEARABLE SAFETY**  
**CONTENT REPORTS AND ANALYTICS SOFTWARE**

**The IMPACT technology suite is designed to lead tunnelling communications and digital network infrastructure into the future. The IMPACT infrastructure has been specifically developed for the tunnelling and mining industries to operate within the harsh environments encountered in all underground operations.**

The underground network is the heart of a scalable, high-speed data and communications system. It is able to cope with time sensitive, high-bandwidth applications, enabling functionality

such as Voice over Internet Protocol (VoIP), video streaming, remote PLC programming, mobile data acquisition, real-time vehicle diagnostics and asset / personnel tracking.

The IMPACT system delivers improved capabilities for current and future mine requirements through higher reliability and support for open standards. It also elegantly addresses the challenge of power distribution in a tunnel environment.

The IMPACT system provides a quantum leap forward from traditional technologies, being specifically designed for ease of installation in the unique conditions of the tunnelling environment.

## Features and Benefits

### MOBILE DEVICE DATA DOWNLOADS

- Enables handheld devices (PDAs, tablets etc) to transfer data wirelessly whilst underground

### POWER OVER ETHERNET (POE) SUPPORT CAPABILITY

- Quick & easy node extensions, with four PoE ports
- Other peripherals can be directly connected (Video cameras, emergency call points, PLCs) no need to run additional power cables

### PORTABLE WIRELESS NETWORK ELEMENTS

- Allows for temporary network extensions into working faces

### OPERATES ON TOUCH VOLTAGE

- Eliminates the need for expensive high voltage armoured cable

### MULTI FUNCTION DEVICE WITH TAG READING ABILITY

- Reduced cost through all-in-one device

### “PLUG AND PLAY” SYSTEM

- Faster deployment with lower maintenance costs and improved system up time
- Optic fibre and power in a single composite cable with simple connectors and improved system up time

## For IT Professionals

### MANAGED ETHERNET NETWORK SUPPORTING QOS, SNMP & VLANS

- Allows defined services to be prioritised, and the switches to be managed

### GIGABIT BACKBONE

- Multi service capabilities today and a safe investment for future technologies



# Typical IMPACT Installation for tracking, voice and video applications

The IMPACT product range is designed to form the foundation of, or extend, a robust, multi-service tunnel network. The innovative Wireless Network Switches (NS50) and PoE wireless access points take the network easily and inexpensively into the tunnel. The devices support industry standards, but pack more capability into a single enclosure than devices designed for conventional enterprise networks.

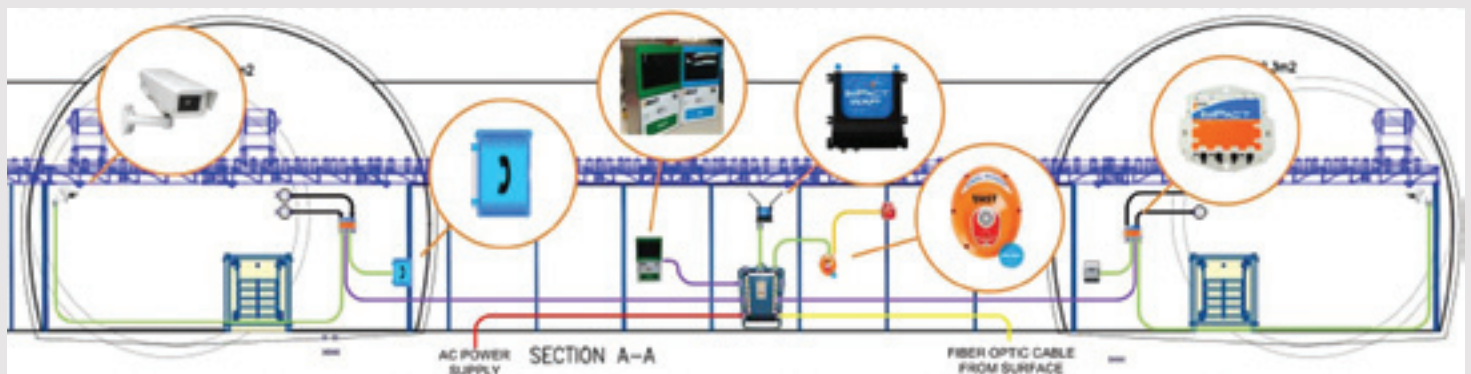
Traditional surface enterprise networks have a star topology which requires power at every network node. This is not a cost effective solution underground. The challenge of limited power availability underground is overcome by using a composite cable, which acts as a power distribution system, as well as carrying the optic fibre data cores.

The devices operate as low as 10V allowing their usage at the end of long cable runs without the need to inject power. As well as being 802.11 compliant Wi-Fi hotspots, the devices have built-in tag-reading capabilities and can support two separate Wi-Fi radio cards which maximises coverage from each node and allows monitoring of travel direction. They operate with MSTs' Active Wi-Fi tags, built into the ICCL Cap Lamps, or stand-alone on personnel, vehicles and other assets.

With the best functionality on the market, the IMPACT network has a proven history of success in supporting the many devices and applications required for modern tunnelling and mining projects, delivered in the most efficient and cost-effective manner.



**Fig1. Tunnel Boring Machine.** Through innovation, MST is leading the digital transformation of tunnelling to enable greater productivity.



**Fig2. IMPACT tunnelling infrastructure.** A proven system for supporting the many devices and applications required in the modern tunnel.

## WIRELESS NETWORK SWITCH (NS50)

- Operates from 10 - 50 Volts DC
- Contains up to 2 wireless access points (Mine Site Technologies or third party)
- 4 x Fibre optic Gigabit Ethernet switch ports
- 4 x rugged 10/100 ports supplying Power over Ethernet (PoE)
- Support for VLANs, SNMP & Quality of Service (QoS) management
- Voltage and Current monitoring of all power rails
- Internal 48V step up converter (for third party access points) and PoE outlets
- IP66 Rugged stainless steel housing



## WIRELESS ACCESS POINT

- Easily deployable PoE wireless access point
- Receives power & data via a single Cat 5e cable
- IP66 Rugged housing
- Mounted directly on to the side or roof / back of the mine
- Cat 5e cables able to be cut and terminated underground
- Semi-skilled labour installation
- Low power consumption



## WIRELESS REPEATER NODE (WRN)

- Full wireless meshing
- Portable, light weight with multiple mounting options
- Dual hot-swap battery via unique Lachlan® wheel
- Intrinsically safe



## COMPOSITE CABLE

- Composite fibre and power cable
- 4 fibres as standard available in multi mode or single mode
- Pre-terminated (no underground termination required)



## NETWORK SERVICES

- Hosted application service
- Proactive network monitoring
- Monthly uptime reports
- Telephone support





#### 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



#### MP71 MINEPHONE

- VoIP handset for in tunnel and external mobile communications
- PTT functionality on up to 24 channels
- Emergency "man down" button



#### EMERGENCY CALL POINT

- Group calling capability
- Emergency initiation via MinePhone
- Rugged steel enclosure
- Optional siren and strobe
- Simple connection and powered by NS50



#### PEOPLE AND EQUIPMENT

- RFID Tags carried by people or attached to equipment are detected by the network devices (NS50s and WAPs)
- Knowing where assets are allows them to be managed more effectively
- Knowing where personnel are at all times increases safety and emergency management



MST offices and support centers are strategically located around the world.

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