

# PED

Mine wide **emergency** communications

Productivity and safety through mine-spec digital applications



# PED

The Mine Site Technologies (MST) Personal Emergency Device (PED®) Communication System is based on ultralow frequency transmission that propagates through rock strata. The PED® System has been in use in mines for over twenty-five years and remains the only proven through-the-earth (TTE) communication system in use at mines. Refinements to the system over this time has further improved its reliability and functionality. It has been installed in over one hundred and fifty coal and metalliferous mines around the world.

The PED® System is an emergency warning system and a daily communication system rolled into one. PED® stands for Personal Emergency Device. The use of ultra low frequency (ULF) signals enables PED to transmit directly through rock strata, so wherever personelle are in a mine, a message can reach them. This is possible because it does not rely on line of sight to an antenna like other forms of communication.

The mine wide signal coverage of PED® also means it is very useful day to day communication system. Hence PED® also stands for Productivity Enhancement Device. Should it be required in an emergency, the user has the peace of mine that the system is already working.

PED® uses ultra low frequency (ULF) signals to send signals directly through rock, so called “through-the-earth” (TTE) transmissions. The main difference between PED® and other so called TTE systems is that PED® is proven and is operating in many mines, 24 hours a day, 7 days a week.

PED® has been installed in over 150 mines since 1990. The system has been refined and enhanced over this time, but the basic working principles remain the same. The ULF transmission system transmits to a number of receiver types to allow a range of applications.

## Features and benefits

### Paging

- > PED® can send a 32 character text message to an individual wherever they are underground.

### Effective Communications

- > For overall communications, PED® complements existing phone and radio systems to maximise benefits to the mine operator.

### Safer Blasting

- > The BlastPED System uses the proven PED® Transmission system to provide a safe and reliable remote blast initiation system.

### Emergency Evacuation Warning

- > Fast, simultaneous communication: emergency evacuation instructions can be sent simultaneously to all personnel in only 15 seconds.
- > PED® has been installed in many mines as their primary evacuation system.
- > A proven, reliable and effective system in emergency situations.

### Remote Control

- > Ventilation fans, etc can be remotely switched on and off to reduce energy usage and manage pre and postblast fan use.

## Applications

Emergency Communications & Management | Text Messaging | TTE Equipment Switching | Wireless Centralised Blasting

# PED

The PED® provides mine wide signal coverage. The ability of PED® to transmit through rock strata means it can truly deliver complete signal coverage to an underground mine.

This is achieved without the need of installing antenna cables in every part of the mine (something more traditional 'line-of-sight' radio systems would require). A relatively small antenna on the surface, or underground, provides complete signal coverage (refer to the operation schematic below). This signal coverage is achieved at a fraction of the cost than any other type of radio system.

Where other systems are vulnerable to rockfall, fire and general wear and tear, PED® greatly reduces these typical problems of unreliability and maintenance.

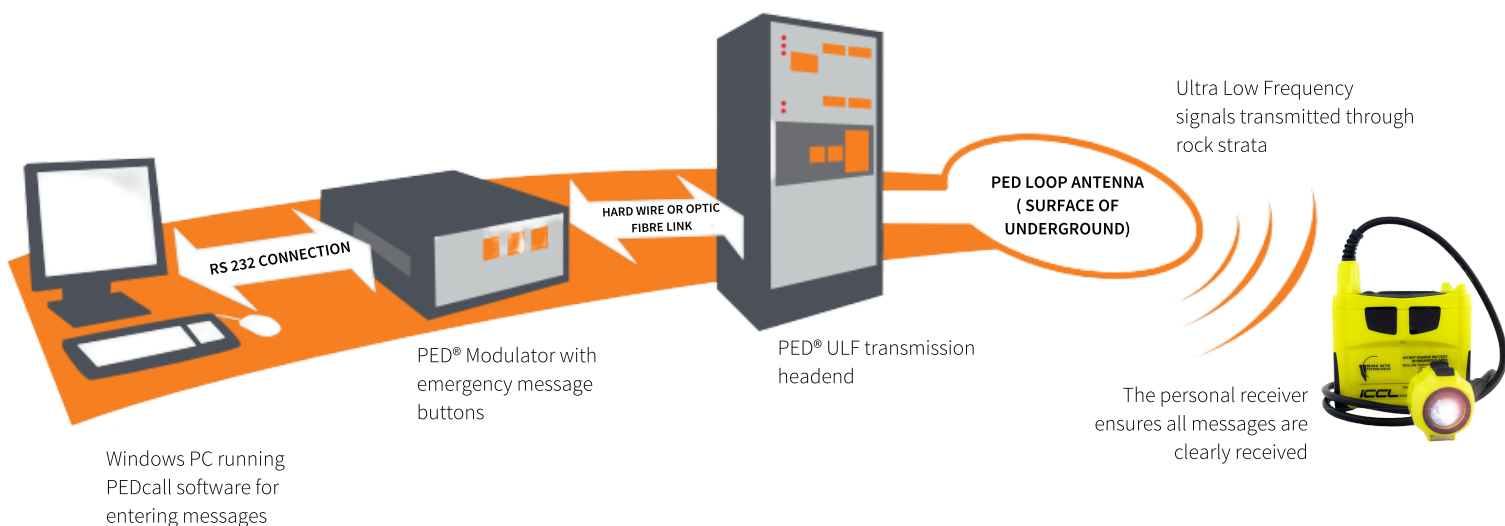
PED® allows the user to contact key personnel wherever they are. It can send a private text message to any individual, wherever they are underground.

This simple, one-way text message can save time and money, for example:

- Groups of miners can receive information, such as the reason for a power failure or that the conveyor system is going to be stopped outbye, etc.
- A belt-man can be quickly advised of a problem that requires investigation (e.g. belt slip re-set).
- A transport driver can be advised of an urgently needed part.

PED® is installed in many mines as the main emergency warning system. In an emergency, messages can be sent to all personnel simultaneously. Importantly not only does PED provide rapid warning, it also provides specific instructions via text messaging such as the nature of the emergency or evacuation routes to use.

## PED® Communications System Operation Schematic



## Mine wide **emergency** communications



### PERSONAL RECEIVER

- > Integrated with a miner's cap lamp.
- > This can be the ultra light weight lithium ion battery pack, known as the Integrated Communications Cap Lamp (ICCL).
- > On receipt of a message, the cap lamp flashes, a buzzer sounds, and the 32 character text message is illuminated on a liquid crystal display.
- > The PED® receivers always indicate that they and the transmission system are operating.



### BLASTPED

- > The Blast PED is the receiver/exploser unit that allows for the remote initiation or firing of blasts.
- > Specially coded signals are sent via the PED® system that ensure the BlastPED receivers only operate when required.
- > This coding, and several other levels of physical and software security, ensure the total safety of the system.
- > BlastPED is approved for use in a number of countries including Australia, USA and Canada and is the only "radio" remote blasting system in general use in underground mines.



### AUTO PED

- > AutoPED is a vehicle mounted receiver to ensure personnel travelling in a vehicle receive messages. The large display on the AutoPED is clearly visible to all occupants.



### CONTROL PED

- > The ControlPED is a receiver that allows the remote switching of equipment, such as fans, pumps, etc. Typically interfaced to the Stop-Start contacts in a device's control panel.

## Technical specifications

### TRANSMISSION SYSTEM

#### Transmission Headend

Frequency: ULF

Output Power: 1.2kVA

Operating Temperature: 0°C - 40°C AV

Power: 110/240V - 60/50Hz AC

Includes: Earth leakage/ground fault detection and lockout

Dimensions

- Housed in 19 inch rack cabinet (H=1200mm/48in; W=600mm/24in; D=600mm/24in)

#### Software

##### PEDCALL®

- > Windows based main system software
- > Individual, groups and general broadcast
- > Name search
- > Custom text messages
- > Message priority
- > Message log
- > 15 second Emergency Message Facility
- > Pre-programmed messages generated at specific times can be networked on mine's LAN

#### Mine Monitoring

- > Custom Interface to monitoring system for automatic message generation
- > Monitors an unlimited number of input
- > Programmable messages to predefined personnel and devices

#### Smart External Modulator

Power: 110/240V - 60/50Hz AC

Input

- Serial interface from PC
- Output 0-20mA to PED Headend

Features: Emergency message buttons (3)

### RECEIVING DEVICES

#### Personal Receiver

Alert: Cap Lamp 10 second flash, buzzer

Display

- 32 character message, graphics, LCD
- LED back light, Time display
- Message Storage (2), scroll facility

Voltage: Cap Lamp battery = 7.4v (nominal)

Power: 30mA

Weight: 200g - 0.4lb

Operating Temperature: -20°C - 50°C (-4°F - 120°F)

Rating: IP65

Display Dimensions

- H=70mm; W=220mm; D=80mm (H=3in; W=9in; D=3in)

#### Control PED® For Fixed Equipment

Power:

- 110/240V - 60/50Hz AC
- 24V AC or DC

Indicator LEDs:

- Power ON / OFF
- Transmission Status

Switching Relays: 110V AC / 5amp

Receiver dimensions:

H=70mm; W=220mm; D=80mm (H=3in; W=9in; D=3in)

Antenna dimensions:

L=170mm; W=30mm; D=30mm (L=6.5in; W=1.2in; D=1.2in)

#### BlastPED® Remote Blasting System

Capacity: Capable of firing 70 ohm series circuit

Security:

- > Individually coded receivers
- > System access only via secure, external media
- > Key/Switch to Receiver
- > Independent supervisory circuit
- > Sequenced command string

Indicator LEDs:

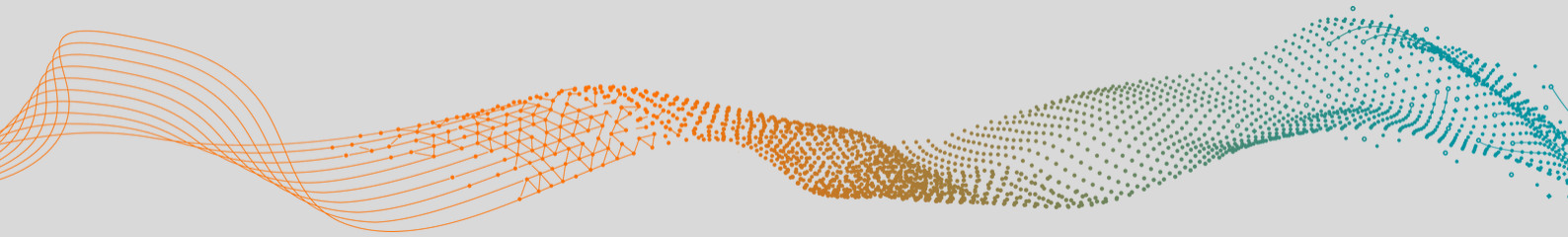
- Battery Status, Receiver ready,
- Arm, Blasted

Rating: IP66

Dimensions: H=480mm; Diam=140mm (H=19in; Diam=5.5in)

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communications



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office today**

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