



Saves Lives

# PED

Saves Costs



Reliable Mine Wide Communication

- Emergency Evacuation Warning
- Personal Paging
- Remote Blast Initiation
- Remote Equipment Control

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The PED<sup>®</sup> Communication System is based on ultra-low frequency transmission that propagates through rock strata (see operation schematic below).

The PED<sup>®</sup> System has been in use at mines for over fifteen 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 & fifty coal and metalliferous mines in Australia, USA, Canada, China and Sweden.

Investment in a PED<sup>®</sup> System is justified on significant cost savings, and safety benefits.

- **Paging**, PED<sup>®</sup> can send a 32 character text message to an individual wherever they are underground.
- **Emergency Evacuation Warning**, in an emergency an evacuation instruction can be sent simultaneously to all personnel in only 15 seconds. PED<sup>®</sup> has been installed in many mines as their primary evacuation system, and has been proven reliable and effective in emergency situations.
- **Overall Communications**, PED<sup>®</sup> complements your existing phone and radio systems to maximize benefits to the mine operator.
- **Safer Blasting**, the BlastPED System uses the proven PED<sup>®</sup> Transmission system to provide a safe and reliable remote blast initiation system.
- **Remote Control**, ventilation fans, etc can be remotely switched to reduce energy usage and manage pre & post-blast fan use.

## PED<sup>®</sup> COMMUNICATION SYSTEM OPERATION SCHEMATIC

The PED<sup>®</sup> System is an emergency warning system.

PED<sup>®</sup> stands for Personal Emergency Device. The use of ultra low frequency (ULF) signals enables PED to transmit directly through rock strata, so wherever you are in a mine a message can be sent to you.

The mine wide signal coverage of PED<sup>®</sup> also means it is very useful day to day communication system. Hence PED<sup>®</sup> also stands for Productivity Enhancement Device. By using it every day, should it be required in an emergency, you know it is in working order.

## WHAT PED<sup>®</sup> DOES

### PROVIDES MINE WIDE SIGNAL COVERAGE

The ability of PED<sup>®</sup> 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 cable 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<sup>®</sup> greatly reduces these typical problems of unreliability and maintenance.

### CONTACT KEY PEOPLE, WHEREVER THEY ARE

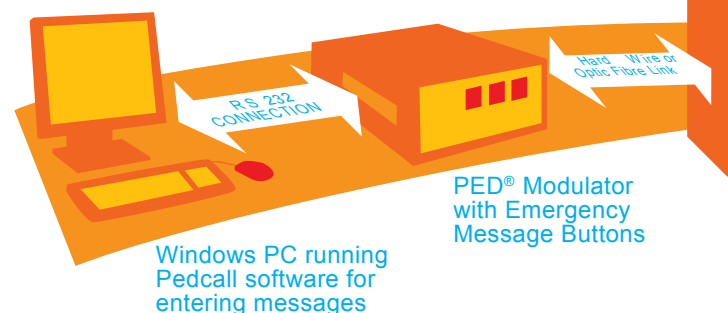
PED<sup>®</sup> can send a private text message to any individual, wherever they are underground. This simple, one-way text message can save time and money, for example:

- 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 beltman 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.

### CONTACT EVERYONE IN AN EMERGENCY

PED<sup>®</sup> 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<sup>®</sup> provide rapid warning, it also provides specific instructions via text messaging – such as the nature of the emergency or evacuation routes to use.



The PED® System has been proven to give significant productivity and safety benefits to a mining operation, large or small.

## HOW PED® OPERATES

PED® uses ultra low frequency (ULF) signals to send signals directly through rock, so called “through-the-earth” transmissions. The main difference between PED® and other so called through-the-earth 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 basic operation schematic is shown in the Figure below. The ULF transmission system transmits to a number of receiver types to allow a range of applications. The receivers are:

- Personal Receiver** is 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), or receiver versions are available to retrofit to some existing cap lamp batteries (such as Koehler-Wheat, Oldham, Northern Lights and MSA). 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**, is a receiver/exploser unit that allows for the remote initiation or firing of blasts. Specially coded signals are sent through 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.
- ControlPED**, is a receiver that allows the remote switching of equipment, such as fans, pumps, etc. The ControlPED receiver is typically interfaced to the Stop-Start contacts in a device's control panel.
- AutoPED**, is a vehicle mounted receiver to ensure people travelling in a vehicle receive messages. The large display on the AutoPED is clearly visible to all occupants.



Personal Receiver



BlastPED



ControlPED



AutoPED



PED®  
Loop antenna  
(Surface or  
Underground)

Ultra Low  
Frequency signals  
transmitted through  
rock strata



Personal Receiver

**Personal Receiver:**

- Beeps and flashes light on receipt of a message.
- Message can be read from the 32 character display on the top of the unit.
- Messages can be sent to individual receivers or to All Receivers at once.
- Stores last two messages in memory.
- Displays time and signal strength.

Other types of receivers are also available that operate off the PED® transmission system. AutoPEDs (in vehicles), ControlPEDs (for equipment switching), and BlastPEDs (for remote blast initiation).

PED® ULF  
Transmission  
Headend

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## TRANSMISSION SYSTEM

Transmission Headend	
Frequency	ULF
Output Power	1.2kVA
Operating temp range	10°C - 40°C (50°F - 104°F)
Power requirements	110/240V 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 & general broadcast Name search Custom text messages Priority Access Message log 15 second Emergency Message Facility Preprogrammed 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 inputs, Programmable messages to predefined personnel and devices
Smart External Modulator	
Power	110/240 VAC
Input	RS-232 9 Pin to 9 Pin from PC Output 0-20mA to PED Headend
Features	Emergency message buttons (3)

## RECEIVING DEVICES

Personal Receiver	Alert Display	Cap lamp 10 second flash, buzzer 32 character liquid crystal dot matrix LED back light, Time display Message Storage (2), scroll facility Cap lamp battery nominal 4 or 7.5 volts 40 mA 200 to 450 grams (1lb) depending on version.
	Voltage Power Weight	200 to 450 grams (1lb) depending on version.
	Operating temperature Rating	-20°C - 50°C (-4°F - 120°F) IP67, Intrinsically Safe
AutoPED® Vehicle Mounted Receiver		
	Alert	Flashing light – 10 seconds Horn optional
	Display	32 character liquid crystal dot matrix LED back light
	Message storage	2 messages Scroll and delete functions
	Power	10/28 VDC vehicle supply Automatic power shut down facility
	Rating	IP65
	Display 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
Control PED® For Fixed Equipment		
	Power	110V AC 50 / 60Hz 24V AC 50 / 60Hz
	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 160 ohm series circuit
	Security	Individually coded receivers System access only via floppy drive disk 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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Mine Site Technologies Pty Limited reserves the right to make changes to the specifications and information contained in this brochure at any time and without notice. MST-PED0113-WW\_V1

