



Productivity and Safety through
Mine-Spec digital applications

PED

mine wide
emergency
communications



Emergency Evacuation Warning

Personal Paging

Remote Blast Initiation

Remote Equipment Control

Applications

EMERGENCY COMMUNICATIONS & MANAGEMENT
TEXT MESSAGING
TTE EQUIPMENT SWITCHING
WIRELESS CENTRALISED BLASTING

The Mine Site Technologies (MST) Personal Emergency Device (PED®) Communication System is based on ultra-low 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 personnel 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 mind 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 maximize 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 post-blast fan use.

PED® for mine wide signal coverage

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.

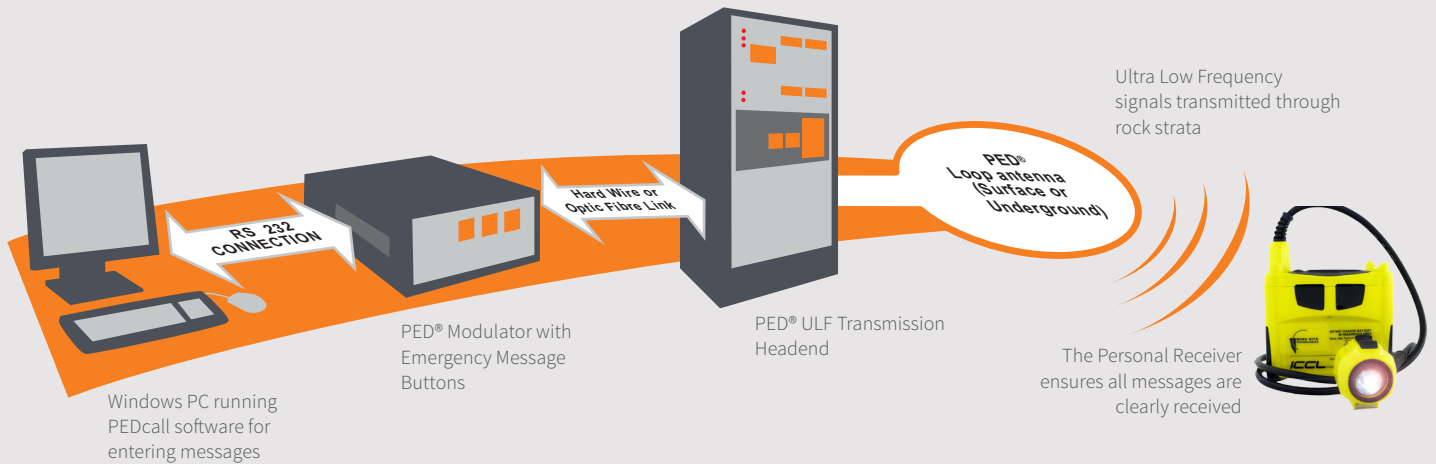


Fig1. The PED® Communications System Operation Schematic.

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/exploder 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.



AUTOPED

- 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.



CONTROLPED

- 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
- 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 input
- Programmable messages to predefined personnel and devices

Smart External Modulator

Power	110/240V - 60/50Hz AC
Input	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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
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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
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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
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Dimensions	H=480mm; Diam=140mm (H=19in; Diam=5.5in)
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