

MineTracer

Underground Communication and Tracking System



MSHA and West Virginia Approved

Product Overview

MineTracer is an integrated wireless communication and tracking system designed specifically for use in underground mines. MineTracer was developed to address the MINER Act and West Virginia Rules for communication-tracking equipment. The installed coverage area is completely flexible - ranging from 100% travel-entry and work area coverage to zonal coverage. In the event of an accident, the system operates on battery power continuously for at least 48 hours after the loss of AC power in the mine. **Every component of the MineTracer system has been approved by MSHA for intrinsic safety.**



Combined Communication and Tracking

For 2-way communication, the MineTracer system uses text messaging rather than voice allowing every miner to communicate to the surface at the same time which is important during an emergency event. Each miner's location and message is time-stamped and recorded in the mine office. The Text Messaging Mobile Communicator (TMC) carried by every miner has a 4-line LCD display and 256 message menu – plenty of

capacity for operations and emergency messages. Custom messages are programmable for each mine. The TMC is also the tracking device. Miners are alerted to new messages via the ringer and a bright flashing LED on the TMC.

MineTracer Network

The TMCs report to Wireless Access Points (WAPs) which communicate location and message data via neighboring WAPs through the network up to the mine office. Three-color LED strobes on the WAPs are used to acknowledge messages sent and to signal section or mine-wide conditions or evacuation. The location of each miner is displayed on a map and in tabular form on a computer in the mine office. Location data for up to hundreds of TMCs and 28 miles of mine coverage is updated every 20 seconds providing continuous safety monitoring of miners from the mine office.

Survivability

What if one or more Wireless Access Points are damaged in an accident? The MineTracer network remains largely operational since only a portion of the system's wireless communication will be blocked. Neighboring WAPs and networking functions remain operational. The mine office is notified immediately in the event of any WAP or network failure.



Tracking-only Application

Mine operators have the option of deploying MineTracer for tracking-only service by using the Mobile Communicator (MC) tag shown here. MCs are equipped with an emergency alert button. When pressed, the dispatcher in the mine office is notified immediately of the miner's location and need for help. The dispatcher can acknowledge the alert message and notify others in the area via LED strobe lights on the Wireless Access Points. Mobile Communicators have a two-year battery life without recharging.



Wireless Sensor Monitoring/Actuator Control

MineTracer goes beyond communication and safety tracking to help manage mine operations and equipment. MineTracer can wirelessly collect and report *any* sensor data for gasses, smoke, air flow, and equipment diagnostics. Sensor monitoring and actuator control are natural extensions of MineTracer's two-way communication capabilities.

Text Messaging Mobile Communicators

- ID number assigned to miner and tracked by MineTracer system
- 2-way communications with 4-line LCD display with bright backlight
 - Top 3 lines for received messages, bottom line for "send" message choices
- 256 message menu, programmable for each mine
- 96 hour battery life per charge for continuous operation
- 300-700 foot range to Wireless Access Points (typical)
- Miner-to-miner mode

Wireless Access Points (WAPs)

- Typically positioned along main travel ways and escapeways every 500 feet
- Mobile location accuracy is +/- 75 feet
- Access Points operate on 6-24V DC power with 48 hour continuous operation on battery backup
- Collect and report Mobile Communicator tracking and message data to Subnet Controller
- Strobe lights acknowledge sent messages from miners and provide mine-wide alerts

Subnet Controller

- Collects, calculates, and manages location data from up to 75 WAPs over a 6 mile area via wireless communication
- Provides intrinsically safe DC power for WAPs
- Interfaces back to Network Controller in mine office via low-cost 12-gauge twisted pair wire (or Ethernet, fiber, leaky feeder) using RS485 protocol
- Monitors and reports on MineTracer system health
- Subnet Controller operates on 95 to 250V AC
- Explosion-proof enclosure with 48 hour standby power

Network Controller and Server

- Central processing of all Mobile Communicator data at mine office or remote office
- Database stores and archives monitored information
- Access to data provided via web-browser user interface on standard PC client
- Can automatically dispatch messages (email) to mine management or anyone as defined by the administrator
- Standard PC works well for most applications

