

Inertial tracking goes underground

AN underground tracking system with a difference is about to hit the US market. InSeT Systems has submitted its Inertial Sensor Tracking and Communication System to MSHA, which at time of print was pending approval.

What makes InSeT's technology different is the inertial navigation technology. It uses a motion sensor to continuously track a miner's direction and speed of movement without the need for external references.

"Our system is based on a patented use of inertial devices utilizing the same technology used in submarines and guided missiles. This truly is 21st century rocket science for coal mines," InSeT chief operating officer Jay Breeding said.

"The inertial device with our custom software generates location data that is accurate to a radius of 25 feet over a period of 24 hours or more.

"And our system provides this data in real time, not just when a tag passes a reader."

The tracker unit includes two-way voice and text communications, with a store and forward feature.

This means a voice message is recorded in the miner tracker and transmitted through the wireless network to the control center on the surface.

The control center can then send a digital voice message to a group or an individual. If the initial message is not received by the control center or the individual user, the time-stamped message will continue to be sent until it is received.

The battery-powered 15-ounce unit with 24-hour emergency battery runtime is worn sealed in the miner's belt holster with LEDs that provide alarm and product status feedback. The data is sent over the self-healing, 900-megahertz wireless mesh network every 30 seconds.

The mesh network gives a range of 1500-2000ft in seams of 5-6ft, but less for low seam heights.

The relays for the mesh network are housed in explosion-proof blast shields.

To provide redundancy, the system uses self-healing properties and links to the surface from multiple exits out of the mine, such as air shafts and belt openings.

InSeT says these redundant paths will usually be over fiber-optic lines to eliminate the chance of radio interference to the base computer station.

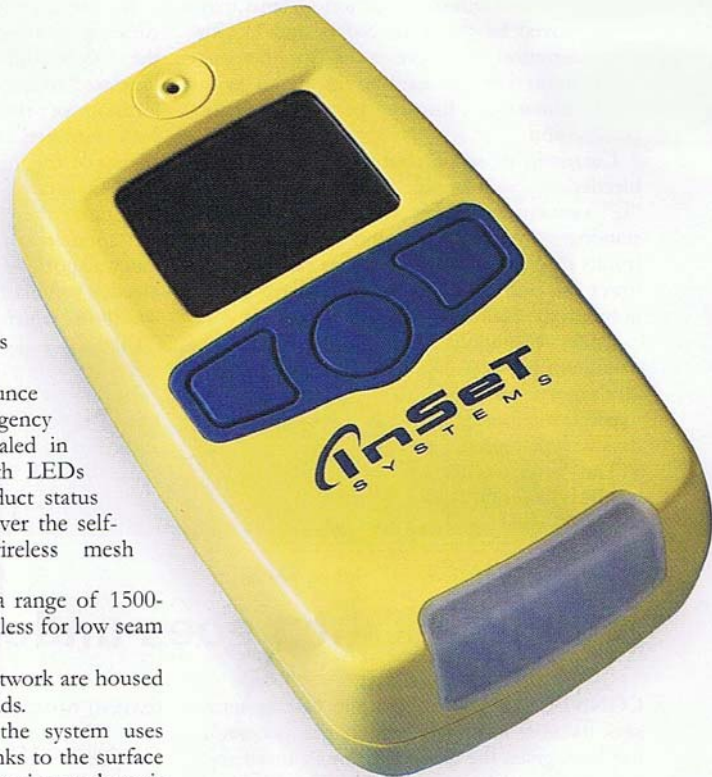
The InSeT system requires only miner tracking units for each person or piece of equipment to be tracked, blast-proof relays as needed to relay the data from the mine, a battery-charging station at the mine portal, and a dispatcher station in the mine office.

The system has been tested in two federal test mines as well as the largest active underground mine in Ohio. The tests evaluated the basic technology, the radio network characteristics, and the accuracy of the location data generated by the system.

"The technology works. The radio characteristics of the wireless mesh network will allow data transmission to the base station as expected.

"The location data with the inertial correction software will provide a location accuracy in the range of 25ft from actual, vastly superior to any other system we know of," Breeding told *Coal USA*.

According to Breeding, the accuracy and real-time nature of the location data will greatly reduce the time spent searching for key equipment and supplies.



InSeT Systems' Inertial Sensor Tracking and Communication System uses inertial navigation technology, where a motion sensor continuously tracks a miner's direction and speed of movement underground.

"The operational improvements possible with the InSeT system coupled with the federal tax credit provided in the MINER Act and extended in the federal stimulus bill earlier this year can pay for the system in one year and generate ongoing profit increases in the following years."

Bucyrus to launch new CM

BUCYRUS will make available its new 25C Continuous Miner to the US market in the first quarter of next year.

According to Bucyrus, the 2 x 275hp miner provides the highest cutter horsepower and the largest chassis and the pivot point designs of its class.

The 25C is equipped with VFD traction control.

The machine is suitable for low to mid seams within a range of 43-120in operating height with hard-cutting conditions such as rock inclusions.

Bucyrus will be displaying the new machine at the Bluefield Coal Show in September.

This truly is 21st century rocket science for coal mines.