4D Scanning Radars for Mining

Sencept radar sensors are an intelligent mining solution offering extraordinary safety benefits. They support digitalization and automation and can help to boost productivity in harsh mining environments.

4D Radar for Mining

The mining industry provides vital resources that our modern society needs. It's an industry at the starting point of the value chain of many products and a major contributor to the economies of producing regions and countries.

The industry now faces ever-growing challenges to improve productivity and manage escalating costs. Extracting deeper deposits in underground mining, where the temperature and humidity is unbearable for workers, can be particularly challenging. Ventilation costs are high and access to water for dust reduction can be difficult.

Sencept's 4D Radar is a cost-effective solution that can boost productivity in those hazardous areas. These intelligent sensors can visualize the environment in all weather and lighting conditions. They are a step towards remotely-operated machines, autonomous vehicles, and robotic platforms

Autonomous Mining, Remote Operations, and Industrial Internet of Things (IIOT)

The automation of mining extraction and process monitoring relies on multiple sensors, such as cameras, lidars, and radars. Poor visibility is common due to the dust after a blast or water spray during the mining process. This limits the abilities of vision-based sensors, such as lidars and cameras. Cameras are also sensitive to lighting conditions and have limited depth measurement capability. Radars, in comparison, are robust sensors and can sustain harsh conditions. Although, traditional radars are not capable of reliable sensing as they only detect objects in 2D space.

At Sencept, we've built a high-resolution 4D scanning radar specifically designed for dense environments. Our radar solution detects objects in 3D space and estimates their speed from the doppler frequency. The electronic scanning capability is enabled by our state-of-the-art hardware and software design. A high update rate and full 4D imaging in real-time is an added benefit.

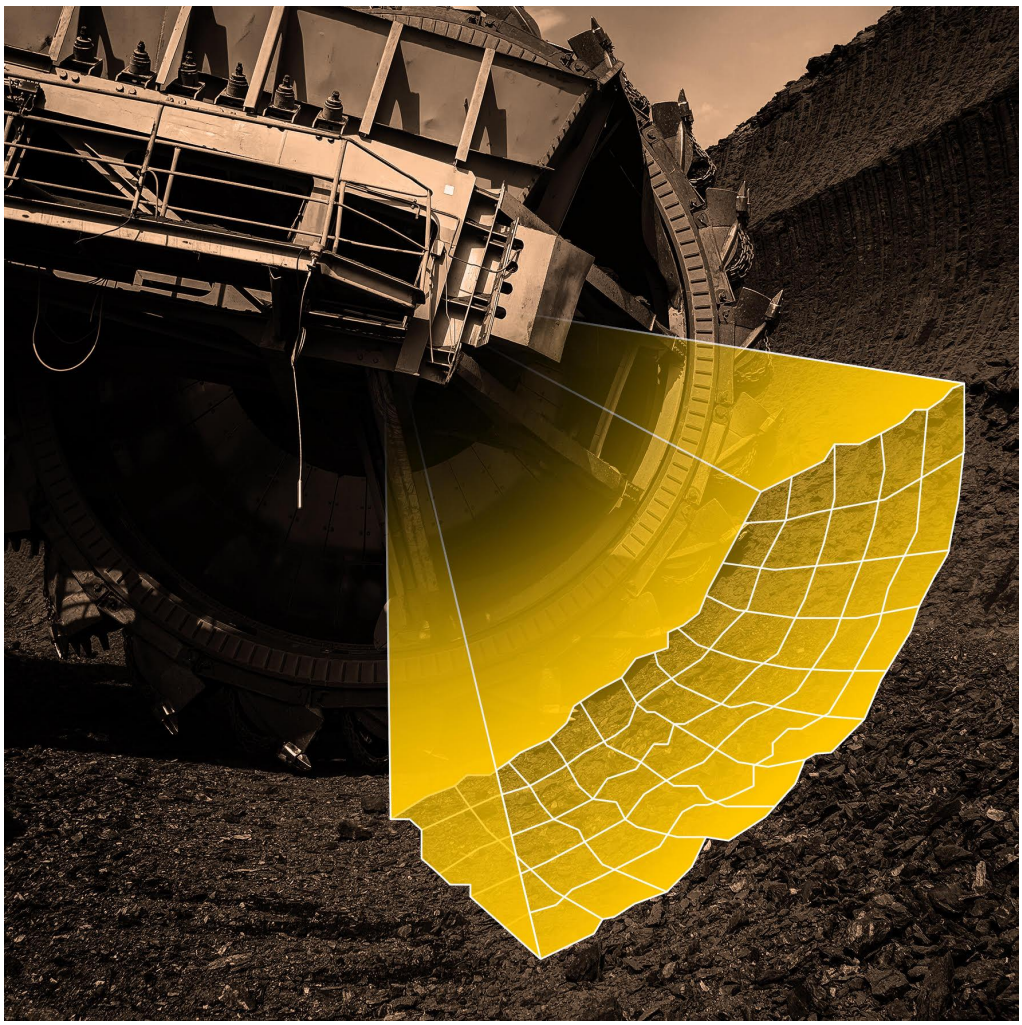
Our sensors are key components to enable autonomous mining or remote operations. They can also be integrated into Industrial Internet of Things (IIOT) platforms to sense the environmental state and mining processes in real-time.

Collision Avoidance

Dirt, dust, debris, and challenging lighting conditions, in addition to large mining equipment, often results in poor visibility and blind spots on mine sites. To avoid collisions, reliable sensors are essential. Sencept's radar is the only radar on the market that can detect small objects (like humans) in the vicinity of larger objects (such as mining equipment).

Sencept's 4D radars can detect an object's position in 3D and the speed it's travelling with high accuracy. What's more, they can do this in dust, darkness, and harsh environmental conditions. Our radars can be connected to any vehicles as retrofit solutions.

Sencept is also developing advanced deep learning methods to identify human workers in real-time to prevent workplace accidents.



Process Monitoring (Under development)

Sencept is developing a state-of-the-art 4D radar system for process monitoring in real-time, with better than one-degree resolution. The radar system will have the capability to measure levels in silos, making volumetric measurements of haul trucks and determining particle sizes on conveyor belts possible.

Are you interested in boosting productivity and safety for your mining company?

Contact Sencept today on info(at)sencept.se