

Empowering Mining Applications with Comba's 5G Solution: A Path to Enhanced Efficiency and Safety



Top three causes of the fatalities in mining that occurs underground are caused by **heavy machinery**, **"fall of ground"** and **working at height**.



Source: [vdata-2021.pdf \(icmm.com\)](#)



Value we bring to the industry

Efficiency

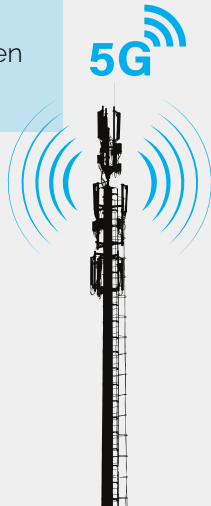
- ✓ Mining automation >90%
- ✓ Faster respond to fault

Safety

- ✓ Reduction of underground staff by 50%
- ✓ Local industry accidents reduced by 16%
- ✓ Remote operation - Safe working distance to mobile equipment

Open Pit Macro Coverage

- Macro coverage provide seamless mobility between underground and surface



Central Operation Center

- 24x7 operations with complete view on the mining operation
- Centralized data for efficient decision making



Rocks Sorting and Hauling

- Automated Rock Filtering and Sorting: Enhancing Efficiency through Size and Quality Classification
- Seamless Underground Navigation: Leveraging 5G Coverage for Smooth Coal Transportation



Remote Operation Center (ROC)

- Mining surface is monitored from a safer location



5G HD Camera / 5G + Video Analysis

- Digital fencing
- Monitoring of workplace safety protocol compliance

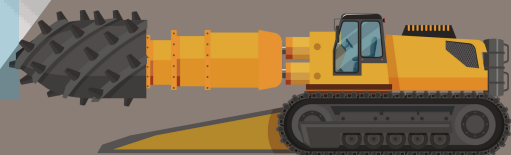
A Multitude of Sensors

- Monitor: Air flow volume, oxygen levels
- Detect pollutant/hazardous gases: carbon monoxide, sulfur dioxide and nitrogen dioxide
- Activate alarm and execute evacuation when detect hazard



Remote Drilling

- Real-time monitoring of working status and remote control of mining machinery and shuttle cars



5G Wearables: Phones, Helmets, Tags, Watches

- 5G high quality video call improved remote diagnosis and resolving technical issues
- VoNR for on-site communication, miners remains contactable
- Indoor positioning system: to track personnel whereabouts , respond to emergencies, and to improve overall safety underground



Remote Rocks Extraction

- Real-time monitoring, shearer auto-alignment, and unmanned operation at the ore face



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