



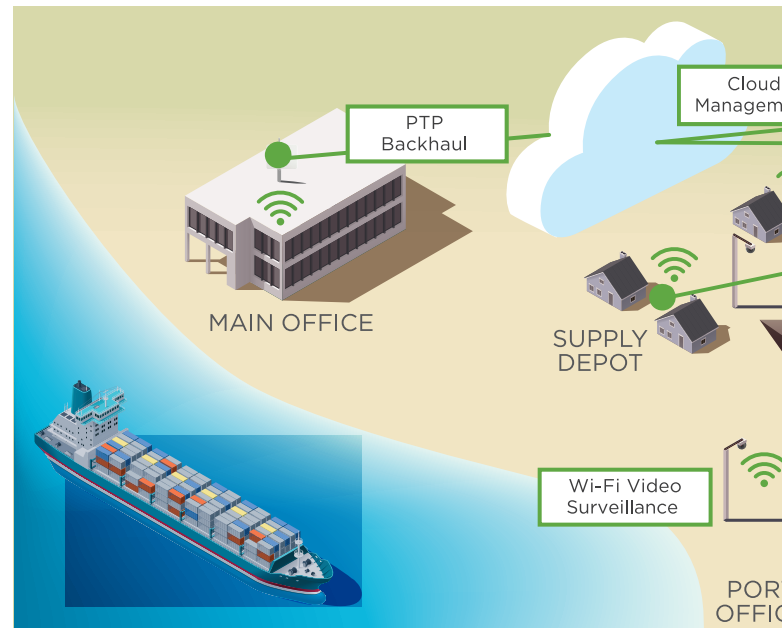
# Wireless Connectivity Solutions for Open Pit Mining

## MINING COMPANIES LEVERAGE WIRELESS COMMUNICATIONS TO INCREASE PRODUCTIVITY

**AND TO ENSURE EMPLOYEE SAFETY.** The worksite consists of autonomous trucks, drilling machinery, and trains – and efficient operations are viewed as one complete “Pit to Port” operation.

### Mining operations face the following challenges:

- Remote, harsh, and often hazardous locations
- Increasing demand for bandwidth-hungry applications
- Rapid deployment and flexible deployment
- Support for temporary communications
- Effective connectivity for SCADA backhaul



### Cambium Networks solutions used in Mining applications:

#### ACCESS

- **cnPilot™ e500, e501** – outdoor wide area Wi-Fi hotspots and field connectivity
- **cnPilot e410, e430W e600** - indoor field office and camp Wi-Fi
- **cnReach™** - wireless connectivity for SCADA/Serial/IP/General Purpose I/O

#### DISTRIBUTION

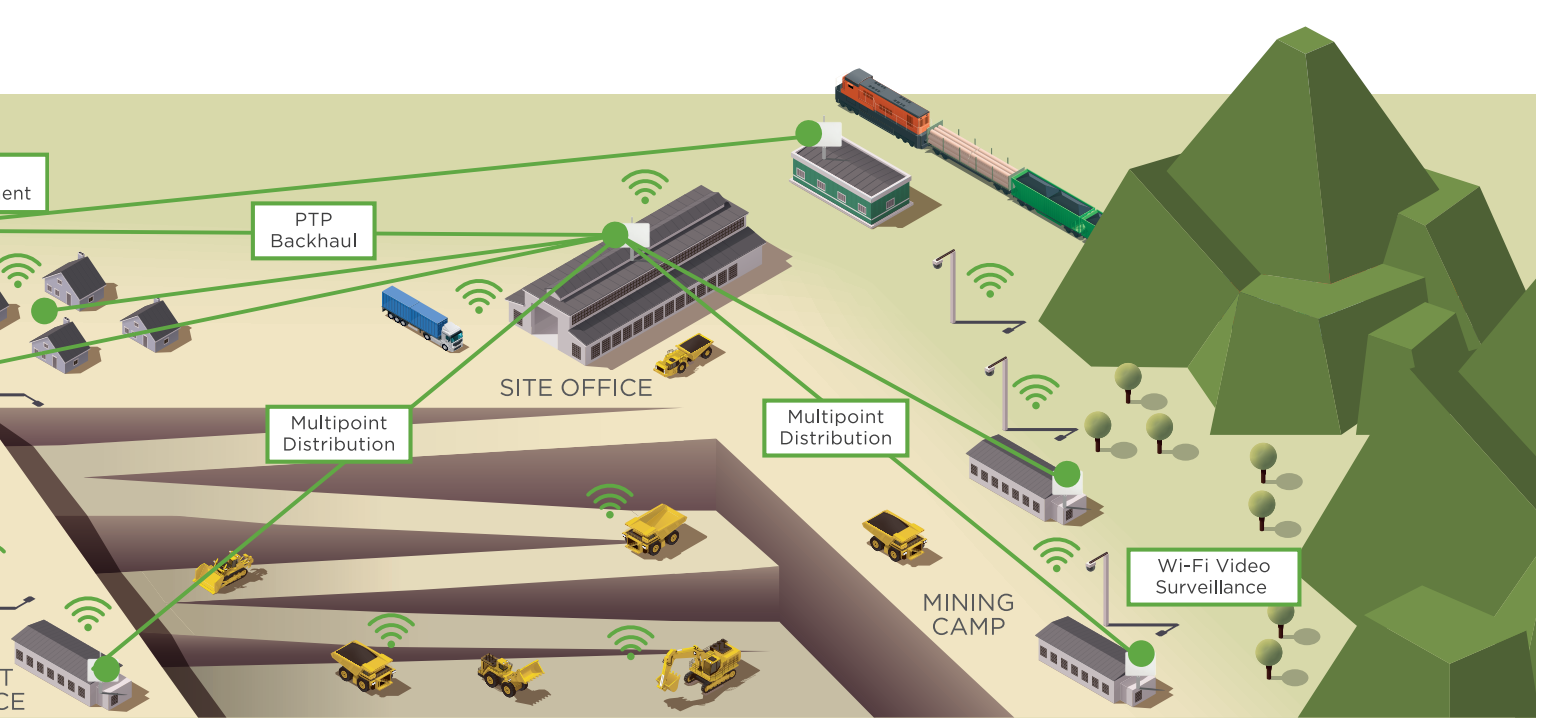
- **PMP 450i/PTP 450i** – 5 GHz and 3 GHz are both used for backhaul from mesh nodes and LTE small cell sites in and around the pit. Systems also provide CCTV backhaul.
- **ePMP** – backhaul infrastructure for Wi-Fi and CCTV
- **PTP 670** - High capacity, long range Point-to-point backhaul for data and mobile radio backhaul.
- **PTP 820** – High capacity, long range, licensed microwave, Point-to-Point backhaul data and mobile radio backhaul.

**cnMAESTRO™** - Single pane of glass network management provides a bird's eye view of field network, rapid on-boarding and provisioning of new nodes, end-to-end performance reports, and fault management

#### Open Pit Mining Applications:

- Autonomous haulage and drilling
- CCTV surveillance
- De-watering control
- Enterprise WLAN
- Mine camp Wi-Fi
- Mobile radio backhaul
- Process control
- Rail communications
- Slope monitoring





## Cambium Networks Technology Ensures High Throughput in Noisy Environments:

- **Adaptive Wi-Fi Architecture** – lets you customize the controller implementation
- **Beam forming and beam steering** – isolates the signal from ambient noise to maximize throughput
- **Frequency Re-Use** – maximizes the use of available frequency across thousands of users
- **Intelligent Filtering** – automatically blocks out noise to improve signal quality

## Cambium Benefits:

**Reliable** – With millions of wireless broadband modules deployed around the world and many in industrial applications, Cambium Networks solutions work in hostile and remote locations. PMP 450i, PTP 670, PTP 820, cnPilot e5xx and cnReach are all IP67 rated.

**Rapidly Deployable** – Fixed Wireless easily supports the mobile and nomadic applications required on constantly changing mine site topography. Wireless equipment is often mounted on trailers and moved according to work demands, requiring that the solution support a nomadic application.

**High Capacity** – Wireless networks can be designed to support simultaneous downloading of streaming video, uploading of video surveillance information, conducting voice calls, and sharing data. Cambium Networks technology has evolved accordingly – from FSK, OFDM, OFDM with MIMO support, and recently Massive MU MIMO – to support increasingly data hungry applications.

**Secure** – security in an autonomous networking environment is paramount, and Cambium Fixed Wireless solutions are designed with security in mind, with password authentication and data encryption is supported on all access network links.

**Manageable** – effective remote monitoring of the wireless infrastructure is key, powerfully enabled by Cambium's cnMaestro Cloud or On Premise management solution.



## ABOUT CAMBIUM NETWORKS

Cambium Networks is a leading global provider of wireless connectivity solutions that strengthen connections between people, places and things. Specializing in providing an end-to-end wireless fabric of reliable, scalable, secure, cloud-managed platforms that perform under demanding conditions, Cambium Networks empowers service providers and enterprise, industrial and government network operators to build intelligent edge connectivity. Cambium Networks' commitment to continuous innovation in wireless access is demonstrated in the millions of radios deployed in thousands of networks that benefit communities around the world. Team members also contribute to social responsibility activities to serve the communities in which they live. Headquartered outside Chicago and with R&D centers in the U.S., U.K. and India, Cambium Networks sells through a range of trusted global distributors.

**[cambiumnetworks.com](http://cambiumnetworks.com)**

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