



Reliable Remote Monitoring in Mining Operations with 4G Industrial Router

Overview

In mining operations, real-time monitoring of vehicles, equipment, and site conditions is critical for safety, efficiency, and asset management. However, remote mining sites often lack stable wired connectivity, making cellular networks the backbone of communication.

Challenge

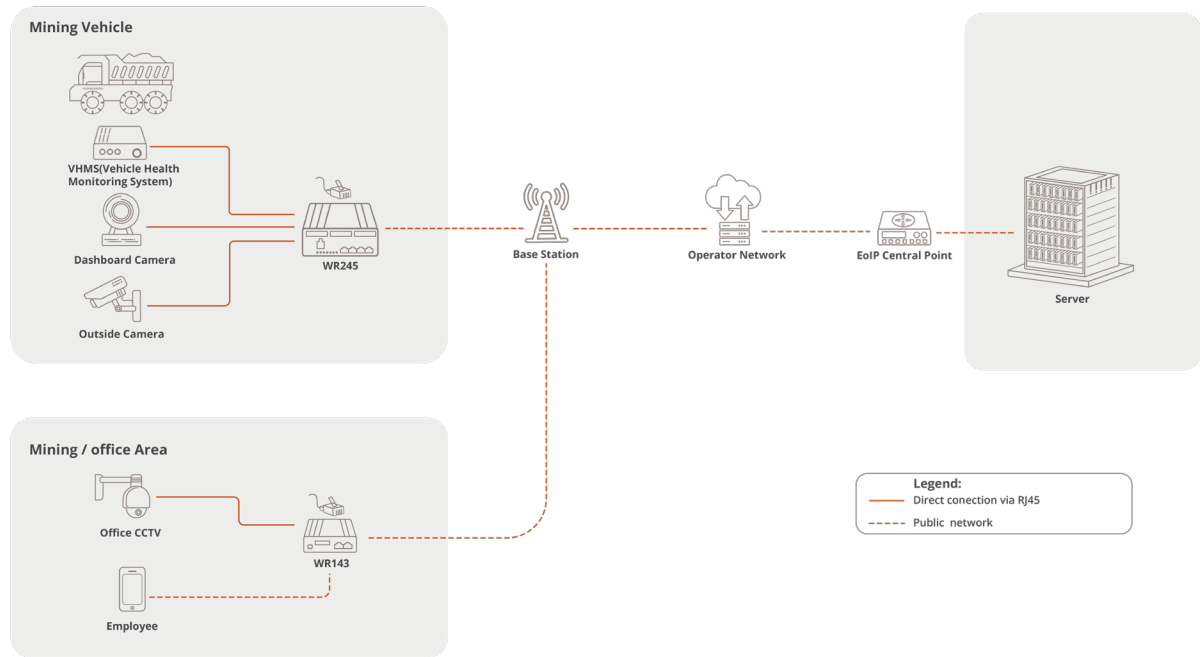
- **Harsh Environments:** Dust, vibration, and extreme temperatures challenge network reliability.
- **Remote Locations:** Weak or intermittent cellular coverage in deep pits or underground mines.
- **Mission-Critical Data:** Delays in video feeds or vehicle health data (VHMS) can impact safety decisions.
- **Safety Compliance:** Real-time monitoring is mandatory for accident prevention

Solution

Our **4G Industrial Router** establishes an **Ethernet-over-IP (EoIP) tunnel** between mining vehicles/offices and the central monitoring hub, enabling

- **Dual-SIM Failover:** Automatic carrier switching ensures uninterrupted connectivity.
- **Always-On EoIP Tunnel:** Persistent layer-2 bridge for real-time camera/VHMS data.
- **Industrial Durability:** Ruggedized design withstands mining conditions.
- **High-Bandwidth Support:** Simultaneously transmits HD video and VHMS data streams

Topology



Key Benefits

- ✓ **Always-Connected Operations** - Sim failover prevents data loss during network malfunctions.
- ✓ **Predictive Maintenance** - Real-time VHMS data reduces equipment downtime by 30-40%
- ✓ **Plug-and-Play Deployment** - Pre-configured EoIP tunnels simplify rollout.
- ✓ **Centralized Visibility** - Monitor all vehicles and sites from a single dashboard.
- ✓ **Enhanced Safety** - Live camera feeds enable immediate incident response

Implementation

1. Field Layer:

- Routers installed in offices and mining vehicles.
- Connects to IP cameras and VHMS via Ethernet.

2. Transport Layer:

- EoIP tunnels over 4G.
- Dual-SIM auto-failover

3. Control Center:

- Unified view of all sites/vehicles.
- Alerts for equipment anomalies or connectivity issues.

Why Mining Operators Choose This Solution

- **Carrier-Agnostic:** Works with any local 4G provider globally.
- **Deterministic Performance:** QoS prioritizes video/VHMS traffic.
- **Low TCO:** Eliminates need for expensive satellite links.

Turn Your Mine Into a Connected Worksite – Without Compromises

With our Cellular Industrial Routers, mining operations gain **uninterrupted intelligence**—ensuring real-time visibility, proactive maintenance, and enhanced safety across your entire site. Stay connected, stay in control, and drive efficiency with **always-on, always-reliable** industrial connectivity.

