

Intelligent Radar-Camera Solution for Remote High-Altitude Industrial Roads

Chile

Technology Partner Wolke	Location Chile 	Industry Segment Traffic	Related Product Milesight AI Road Traffic Radar Pro Bullet Plus Camera > Milesight AI Road Traffic Speed Dome Camera >
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Overview

In remote industrial road networks located at elevations exceeding 4,000 meters, conventional traffic monitoring systems often struggle with harsh weather conditions, unreliable communications, and the absence of grid power. To address these challenges, **Wolke developed a complete intelligent roadside management system** integrating power management, communication scheduling, edge computing, and cloud-based operations. Leveraging **Milesight's AI Road Traffic Radar Pro Bullet Plus Camera and AI Road Traffic Speed Dome Camera as the front-end sensing devices**, the solution has been successfully deployed and validated in real-world high-altitude industrial environments. Through deep software-hardware integration, the system delivers reliable traffic monitoring, event evidence management, and remote management capabilities even under extreme operating conditions.



Challenges



Limited Power Supply

Remote areas lack access to grid electricity, while cable deployment is costly and vulnerable to damage in extreme low-temperature, high-altitude environments, making continuous operation difficult for traditional monitoring systems.



Unstable Connectivity

Fragmented 4G coverage and frequent weather-related outages lead to interrupted data transmission and potential loss of critical evidence.



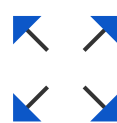
Difficult Maintenance

High-altitude roadside installations require risky pole-mounted servicing, with frequent on-site inspections driving up labor and travel costs.



Limited Expandability

Most camera systems feature closed architectures, requiring full hardware replacement to integrate additional sensors or recognition modules, resulting in high upgrade costs.



Fragmented System Architecture

The market lacks an integrated solution, with power supply, communications, front-end devices, and data platforms sourced from different vendors, leading to poor interoperability and siloed data management.

Solution Highlights



Flexible and Highly Expandable Milesight Front-End Hardware

- Milesight AI Road Traffic Radar Pro Bullet Plus Camera**
 - Integrates millimeter-wave radar and high-definition video capture into a single device.
 - Simultaneously measures vehicle speed and captures evidence.
 - Offers multiple I/O interfaces, serial ports, and LoRaWAN expansion capabilities for flexible integration.
- Milesight AI Road Traffic Speed Dome Camera**
 - Features an open hardware architecture with a wide range of expansion interfaces.
 - Supports PTZ functionality for wide-area monitoring and remote inspections.
 - Enables seamless integration with RFID vehicle identification systems and roadside sensors through open SDKs.
- Local Storage and Edge Reliability**
 - Built-in large-capacity local storage ensures continuous event recording during network outages.
 - Automatically synchronizes buffered evidence when connectivity is restored.
 - Matches Wolke's modular deployment strategy, allowing future system expansion without replacing core devices.





Wolke's Full-Stack Intelligent Infrastructure Platform

Intelligent Energy Management

- Wolke's proprietary energy management algorithm optimizes solar panels and lithium battery storage systems.
- Dynamically adjusts power consumption under low-temperature and low-light conditions.
- Prioritizes radar and video surveillance functions while intelligently suspending non-critical peripherals.
- Enables long-term autonomous operation without grid power.

Redundant Communication Architecture

- Customized cellular and satellite dual-network communication framework.
- Automatically detects network conditions and switches between communication channels.
- Ensures reliable transmission of alarms, enforcement evidence, and operational data.

Edge Computing and Device Orchestration

- Wolke's edge controller centrally manages cameras, radar sensors, power systems, communication modules, and peripheral devices.
- Event analysis and data filtering are performed locally to reduce bandwidth consumption and improve response speed.

Unified Cloud Management Platform

- Supports centralized device management and data aggregation across all deployment sites.
- Provides evidence archiving, alarm notifications, remote maintenance, operational dashboards, and full event traceability.
- Delivers end-to-end visibility and management through a single platform.



Deployment and Maintenance Optimization

- The entire deployment architecture was designed and coordinated by Wolke.
- Foldable roadside poles simplify installation and maintenance operations.
- Combined with Milesight's modular camera design, the solution significantly reduces risks associated with high-altitude maintenance and long-term operations.

Conclusion

The successful deployment demonstrates how the combination of **Wolke's full-stack intelligent infrastructure platform** and **Milesight's highly adaptable traffic cameras** can overcome the **challenges of remote, high-altitude industrial roads**. By integrating autonomous solar power management, redundant communications, edge intelligence, and flexible camera hardware, the solution delivers reliable traffic monitoring, event evidence management, and operational visibility in challenging remote environments. The project not only improves road safety and operational efficiency for industrial operators but also establishes a scalable blueprint for future deployments across remote mining sites, logistics corridors, and industrial road networks worldwide.

Related Products



AI Road Traffic Radar Pro Bullet Plus Camera

- Real-time Speed Measurement
- On-Edge AI-powered LPR
- Traffic Congestion Detection
- Traffic Violation Detection
- 4X/12X AF Lens or Motorized Lens
- 2 Lanes & 32 Vehicles Monitoring
- 1/1.8" Sensor & 0.002Lux Starlight
- 60fps High Frame Rate



AI Road Traffic Speed Dome Camera

- Traffic Violation Detection
- Intelligent AI-powered LPR Algorithm
- Evidence Camera Linkage
- Plate Data Management
- Flexible Pan, Tilt and Zoom Tasks
- 36X(5.7~205.2mm) AF Lens
- 1/8" Sensor & 0.002Lux Starlight
- 60fps High Frame Rate